The Motor
INCORPORATING Motor Cycling & Motoring

Vol. 3, No. 54,

February 18th, 1903.

THE FUTURE OF LIGHT MOTORCARS

By Sir DAVID L. SALOMONS, Bart., M.A.

At a time when public interest and public expectations are centred upon the light car of the future, the following article is particularly welcome. As far back as 1895 and 1896, Sir David Salomons was a valued contributor of articles on motor matters in "Cycling," and in placing this article before our readers, we recall, with pleasure, the fact that Sir David Salomons' most interesting articles were accorded a prominent position in "Cycling" before the existence of any motor journal.

I have been so closely associated with the motorcar movement from its start or, rather, revival—for we must remember that a true start was made between the years 1820-30—that I feel able to speak with as much freedom upon the subject as anyone in or out of the trade at the present time. In 1895, with the object of eliciting public opinion and the views of the Press in regard to what at that time was an entirely novel subject in this country, I organised a public display of motorcars at Tunbridge Wells, and by the aid of friends and with my own vehicle, three cars and a tricycle were shown. Such a number gathered together was considered a feat at that time. In our day events move rapidly and although but eight years have passed since the time mentioned, a time, indeed, when it was illegal to place a self-propelled vehicle upon the road, except under impossible conditions, we see to-day cars all over the country, and even invading the fashionable precincts of Hyde Park during the season. The result is due in a large measure to the favourable views which were universally expressed after the Show of 1895.

The motorcar which I owned at that moment, and which I obtained almost as a favour, carried a motor of 3¼ h.p., and this the makers regarded as absurdly powerful Their standard types were 3 h.p. and 3½ h.p., and I was charged an additional sum for the extra ¼ h.p. which I wanted, for more power could not be given. I, of course, refer to the petroleum spirit type of motor and not to steam. In a series of letters to the papers as well as in lectures and pamphlets, which I wrote at the time, I pointed out the absolute necessity of estimating at least 10 h.p. per ton if a useful result was desired. I spoke at that time to several French industrial chiefs, who shook their heads at the suggestion and such an absurd estimate. However, we now find that the horse power I suggested is about the usual practice, viz., 10 h.p.

THERE IS NO MAGIC IN THE FIGURE,

for it can easily be calculated. This is, approximately, the power necessary to draw a ton, including the weight of the vehicle, in a hilly country at the average rate of 12 miles an hour, assuming that on the level and downhill this speed is not exceeded. At that time the choice was between the De Dion tricycle, the Panhard-Levassor cars, and the Peugeot carriages. In fact, there were no other makers, with the exception of one or two German firms, such as the Daimler Company. The house of De Dion and Bouton clung to their tricycles and heavy steam omnibuses for a long period, while the other two makers mentioned kept to carriage work, struggling always to build them larger, and the feeling in France about the year 1899, was entirely in favour of heavy carriages, to carry many people, and of powerful racing cars.

From the start I never altered my opinion that

THE LIGHT CAR WAS LIKELY TO BE MOST IN DEMAND

in the end. I urged the Count de Dion to make me one, and it took two years from the date of the request till he brought out the first types which are now so well known, and now the opinion to-day is generally in favour of the light cars. There are very good reasons why they should always be in demand. They are cheaper than the large type, and though dearer than the tricycle or motor-bicycle, the difference in expense is not great, when compared with the enormous advantages presented. A light vehicle can always be pushed in any case of need, whereas the heavy one would require two persons. Consequently the light vehicle can be used with a sense of security by a single individual, which would not otherwise be the case. The engine being less powerful it is easier to start and simpler to keep in order. The amount of fuel used is naturally less, and the wear and tear of tyres is reduced in proportion to the lightness of the carriage, and less liable to give trouble. In fact, the light car to carry two, three, or four persons with an eight or ten h.p. motor meets the wants of nine persons out of ten, not only the class who have carriages for their amusement, but also the professional and trading classes who require them for money-making by saving their time and delivery of goods.

THE LIGHT STEAM CAR

does not appear to give complete satisfaction at the present time. All I have seen are too frail, according to my judgment, and only give off considerable power by straining the entire mechanism, although for heavy work nothing is so good as steam. I must therefore confine myself to the petrol type of motor, the main objection to this class of motor is that the user must have a thorough knowledge of its construction and peculiarities and always be ready and capable to prevent or cure a breakdown, which is inseparable from these motors if certain precautions are not taken in their construction, to which I will refer in detail later.

Notwithstanding the many creditable attempts on the part of English manufacturers to produce these cars, there are

certainly none to-day so good as the best to be found abroad. We are younger at the industry, and copy a great deal too much what others do, while our foreign competitor, being more experienced, does not fear to go ahead. The most remarkable fact that I have observed in regard to the English industry is that in every case, as far as I am aware, the prices are much higher than they are abroad, while the car is, in general, inferior. This is certainly a falling-off from English enterprise as it used to be before the tremendous American competition, when we produced the best and cheapest article for the world's consumption, no matter what it was. I venture to believe that until we can produce the particular article under consideration as good and cheaper than it can be obtained abroad, no substantial progress will be made, and the number of wealthy people inspired by patriotism, or false patriotism, who purchase their cars in England, will soon be exhausted, and the works will remain idle. This process has been gone through in France, and many a weak company has gone to the wall as a direct consequence of the active competition with those who produced a better article at a lower price, and to-day

A VERY DECENT LIGHT CAR CAN BE OBTAINED AT A MODERATE COST.

probably one-half of what it can be bought for as an English-made vehicle. What is still more remarkable, is that in the many price lists in my possession, I find English agents selling foreign cars at ridiculously higher prices than they are sold for in France. As I am aware of the discounts they receive, I know perfectly well that they can afford, with profit to themselves, to sell at the same price at which the cars can be obtained in Paris, with the exception of the question of royalty on a special type of pneumatic tyre, should this be selected. I have been appealed to over and over again by friends who have asked me whether the prices charged by certain English agents were fair, as they understood that in Paris the prices were lower, and I felt ashamed that my fellow countrymen should be so barefaced, as in some of the instances placed before me. In one case the price including the discount which the makers gave, amounted to over 50 per cent. I would strongly urge that the English industry be re-modelled on a commercial basis, and arrangements made with the French manufacturer that their cars should be sold in England at the same price as they can be obtained abroad, and I do not anticipate that there will be the slightest difficulty in this respect. Unless something of this sort is done, a great bar will be set to the advance of automobilism in this country. Of course it is absolutely essential that the

ENGLISH MAKERS MUST BRING THEIR PRICES DOWN

to the level of the foreign manufacturer or they cannot live except by favour.

It is the same story as regards the accessories of cars. A certain piece which I required a short time ago I purchased in London, at the listed price, of a good firm for 1s. 6d. I knew at the time this was a great deal too much, but I had no alternative. I then wrote to Paris for a similar piece, for which I was charged fourpence and the postage. The complaint I make does not refer specially to the piece mentioned, but to most accessories, and at a time when such tremendous efforts are being made by England, France and Germany to get the motorcar trade, it is essential not only that everything shall be of the first order, but at the lowest price.

There is one matter to be borne in mind with regard to the cutting of prices. Many most important little details are omitted which would give greater security against breakdown, and enable many an owner to rectify small troubles without difficulty if they existed. As some cars are now constructed it is positively a troublesome and dirty operation to go through the various duties essential in the care of a motor, and all of this could be remedied; but the price of the car would be raised probably £10, and then such a car when compared with a somewhat similar one by another maker would appear more expensive. It is very hard to convince a man who knows nothing of the subject, that the extra £10 might save him vexation unlimited, and much expense in the future, because the maker, who does not provide these matters, and the seller, will naturally assure him that they are not wanted, and that therefore the car is simpler to use because these few little really necessary additions are absent. I have known of instances where the purchasers of cars have given up motoring simply because they could not master the few points which would need no mastering at all, if certain little matters had been provided in the vehicle. Journalism can do a great deal to convince people as to what is necessary, and indicate the direction where they ought not to grudge a few extra pounds.

THE MAIN POINTS,

apart from the general requirements in a motorcar, which should be specially attended to, are those which will enable the person in charge to do all the necessary cleaning of the engine parts, minor repairs, and replacement of portions which wear, with ease and without tools, and that all such parts should be easily accessible. These portions may be generally summarised in the sparking plug, valves, commutator, adjustments for wear and tear, springs, and such other parts as require continual or periodical attention.

The following are some of the improvements which I have added to my own cars. Instead of attaching the wire by means of terminals to the sparking plug, I have an intermediate piece which can be disconnected from the plug somewhat after the fashion of taking out and replacing an electric lamp. Consequently, less than five seconds are required to remove the plug for examination or cleaning. Then, in many makes of engines, in order to gain access to one or other of the valves, it is necessary to unscrew two unions and remove a copper pipe. This pipe I cut in half and put a single union with a much coarser thread, and the screw collar of the union so arranged that no tool is required to undo it. I also add in all directions little details to avoid the use of tools, and to enable the brakes, etc., to be adjusted by means of right and left hand sleeves. It is also important to have a tap on the petrol pipe close to carburetter, and not turn off the spirit near the tank, which is the common practice. The motor will always start much more readily this way, since no air is likely to lodge in the tube leading from the reservoir to the carburetter. Again, a small pipe should lead from the top of the reservoir to a point close to the carburetter with a small tap at its end, and the reservoir itself should be hermetically closed. In this manner, when the petrol is turned on, the air tap, being close by, is seen and opened at the same time and never forgotten, and by this method the spirit can be kept in the reservoir for months in perfect condition.

Arrangements should be made to fill all reservoirs without the necessity of lifting the seat cushions, and the entrance so constructed that funnels become unnecessary, a gauze being placed at the filling points, and so arranged as to be removable for cleaning.

MANY OTHER LITTLE MATTERS

might be mentioned under the head of convenience and rapid adjustment, which users of cars know the want of well enough. I would strongly advise in all cases that a canopy, or as the French term it, a "dais," should be added with a glass in front. This acts as a protection against the sun, rain, wind and dust. The glass can at all times be raised when the weather is favourable. To keep the dust out from behind, the usual curtain should be pulled down, and the inconvenience, usually experienced, of being unable to see behind is entirely obviated by adopting my plan of inserting a large celluloid window, which, being flexible, can be rolled up with the curtain.

It is absolutely essential that arrangements should be made to secure the user against the danger of back-fires. Many devices exist to this end, and the purchaser of a car should insist on having one or other of them added, seeing that they can be obtained for a sum not exceeding £2.

In conclusion, I am confident that for those who have the energy to conquer the difficulties to manage, repair, and keep in order a motorcar, its use will be found invaluable, not only to those of limited means, but to more fortunate classes.

THE NEW YORK MOTOR SHOW.

New York seems to have made as great a success of its great annual Automobile Show as have its sister cities, Paris and London. As illustrating the growth of the industry in America it is recalled that at the first motor show in November, 1900, there were twenty-eight exhibitors. A year later, at the second show, the number had risen to only thirty-six, but in the following twelvemonths or more the progress was so rapid that at the show held in Madison Square Garden, from January 17th to 24th last, the exhibitors numbered no less than 142, occupying amongst them 195 exhibition spaces. Commensurate with the growth of the industry, public interest has expanded and, as a consequence, the attendance at the show has been very gratifying. The shows of 1900 and 1901 were promoted by the Automobile Club of America and the Madison Square Garden Co. During the course of the 1901 show the National Association of Automobile Manufacturers decided to take a hand in the promotion of future shows and to share in the profits. As a result of the support thus officially given by the trade there was this year a very great demand for space, necessitating not only the use of the whole of the ground floor of the hall, but of the restaurant, of the boxes on the first tier or balcony, and of part of the basement. With a view to making the utmost use of the available space the gangways were reduced to the narrowest proportions, platforms were abolished and no railings were placed round the exhibits. Certainly the discontinuance of the use of platforms, and particularly of railings, permitted of the much freer circulation of the crowd of visitors and thus relieved the congestion of the gangways, but it was generally admitted that the effect was thereby spoiled in a very large measure, the cars standing in unmarked rows like vehicles in a market-place. But taking the stands separately, which, of course, is what was done by every visitor with any interest deeper than that of merely wishing to see a sight, the display was excellent. The completion of the show was delayed by the late arrival of the steamer, "St. Louis," which had on board some Mors, Renault, Decauville and Clement exhibits. These were staged, however, early in the week.

OF THE EXHIBITS

it would seem eighty-four distinct patterns were shown, and the classification of these shows that the tendencies in America are practically the same as in France and England. The distinct and different patterns of steam, electric and petrol cars numbered as follows:—

Electric	8
Steam	11
Petrol	65
	84

Taking these in their order, of electric cars two were driven by double motors and six by single motors; five were low

A General View of the Motor Show in Madison Square Garden, New York. (From "Automobile World.")

voltage and four were high voltage, the Columbia figuring in each class and thus varying the total figure; four drove by chains and four by gearing. Wood wheels and single tube tyres were in the majority, and the whole were steered by lever.

Of the steam cars, two had water tube boilers, one a flash boiler and eight had fire tube boilers. Only one had the engine in front, the other ten having it under the body, whilst only two had the boiler in front. Eight had wood wheels, one had tubular and two had wire wheels; detachable tyres were slightly in the majority. Seven steered by wheel and four by lever; four were provided with condensers.

OF THE PETROL DRIVEN CARS,

39 had vertical motors and 26 had horizontal motors. Two-cylinder motors were in the majority, 28 cars being so driven, whilst 22 had one-cylinder engines and 15 had four-cylinder engines, and only two had three-cylinder engines: 35 had the motor in front and 30 had it at the rear; 12 were provided with mechanical inlet valves. Wood wheels were in a vast majority, no less than 56 patterns being so fitted, detachable tyres and wheel steering were on 51 patterns. Transmission method compare thus: single chain drive 34, double chain drive 11, bevel gear drive 18, and spur gear drive 2. Ignition compares thus: by batteries 44, by magneto or dynamo 5, by both 16. These figures show that the petrol driven motor is in a large majority, that the most popular type is driven by a two-cylinder vertical engine driving by double chain or bevel gearing, steered by wheel and provided with wooden wheels fitted with detachable tyres. The cars with horizontal motors placed behind drive invariably by single chain on to the differential.

To enumerate and describe the various exhibits, of which full details have reached us, would, to our way of thinking, be of little advantage to our readers. What, perhaps, will be of use will be a few notes on the tendencies shown and some of the opinions and feelings in the trade at the close of the show. It will, therefore, suffice to say that amongst the steam cars were shown the Stearns, White, Locomobile, Toledo, Prescott, Mobile, Foster, Grout, etc. The electric cars include the Baker, Columbia, Studebaker, National, Waverley, Centaur, V.E.C., and Ajax, whilst the petrol cars include not only the whole of the American products, but also a few from Europe.

It is generally considered that

STEAM AND ELECTRIC CARS WILL CONTINUE TO HOLD THE FIELD,

which is theirs at the present day. The electric car is particularly well-adapted for town work, being free from the contingencies of delay, not only on the road, but in the stable, whence it can be turned out at a moment's notice. Edison's new featherweight storage battery is shown at Madison Square, but there seems to have been little or no excitement created by it. For lightness we have ourselves seen nothing to in any way equal the new Edison plate, a specimen of which was shown us some few months ago by a confidante of the inventor, but the question of its wearing capacity has yet to be proved.

The steam car, it is considered, will be made in numbers largely in excess of the present production, because the steam engine fulfils the fundamental requirement of having a constant turning effort on its motor shaft, and this is considered most desirable for automobile propulsion. To get this constant turning effort the petrol motor has to be built up of a number of motive units so that the two and four-cylinder cars are quite the usual thing, and even an eight-cylindered machine has been made by Charron's firm in Paris. This use of multiple units means a multiplication of parts, but is quite unavoidable, and by comparison both the steamer and the electric car are much more simple.

The efforts to solve the problem of

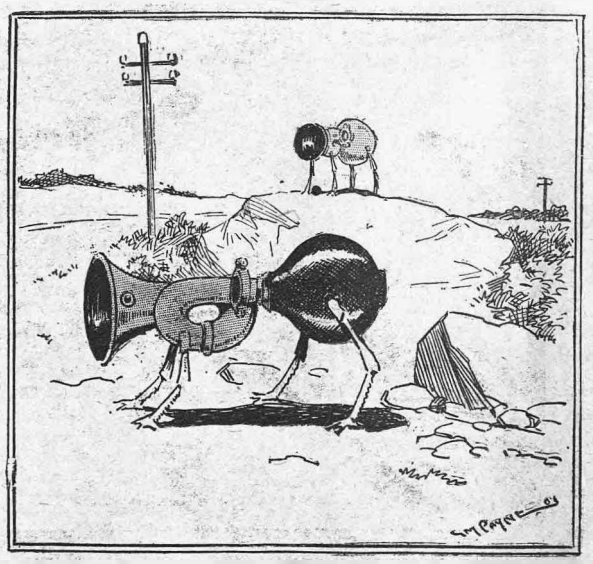
THE AUTOMOBILE FOR THE MASSES

have uniformly resulted in America in one of two courses being taken. The planetary gear style of runabout, exemplified on the English market by the Oldsmobile, is generally surrendered to. Otherwise the effort is abandoned in favour of a more immediately remunerative touring car. The reason for this is obvious to those who are conversant with the conditions obtaining on the other side of the Atlantic. Some makers, notably the Olds Motor Works, have reached their decision early and have stardardised the pattern, and are in every way prepared to turn it out in large quantities. Consequently there is no margin for competitors to play with in the introduction of new types of unproved efficiency. The Orient buckboard, illustrated by us a fortnight ago, is one effort to break away, which may have more chances of success than other efforts have had.

The wire wheel is being abandoned on all hands because, whilst it has ample strength for supporting the load on the axle, it offers little resistance to side impact, and, as a second reason, it looks flimsy when placed under a substantial car body. Wood wheels look capable and are thoroughly reliable. A wheel made out of pressed sheet-steel, cut and formed to artillery pattern, internally reinforced and then brazed up, is regarded as very promising because of its strength and moderate cost.

In radiators, the new multitubular form introduced in the Mercedes car, has proved acceptable to American designers, and the general lines of the European cars with Mors pattern bonnet, bucket seats and tonneau body are being generally adopted. In fact, it would be difficult to see where lies the difference between the newer patterns of American petrol cars and their fore-runners on this side of the Atlantic.

The motor-bicycle is curiously out of the running at the New York show, Americans seeming to be all behind in this branch of motoring. The patterns shown were the Thomas, the Marsh, the Orient, the Indian and the Merkel. The Orient has a 3 h.p. engine, 3in. bore by 3½ in. stroke, driving by a two-ply belt one inch wide, a jockey pulley, which can be manipulated from the saddle is used. The carburetter is a well-designed article. The E. R. Thomas has a 2½ h.p. engine, forming part of the diagonal tube, and is now provided with trussed-spring front forks. The pulleys are V shaped, that on the engine being corrugated. Power is transmitted through a ⅜-in. cycle chain wrapped helically in a cover of thick leather. The results from this "belt" have proved splendid: the idea might be tried over here. The Marsh has a 3½ h.p. engine, placed in the bottom bracket angle, driving by a 1¼in. flat two-ply belt, which is adjusted by a jockey pulley. The Merkel also drives through a flat belt and silences through one of the frame tubes. The Indian is chain driven.



MOTOR NATURAL HISTORY.

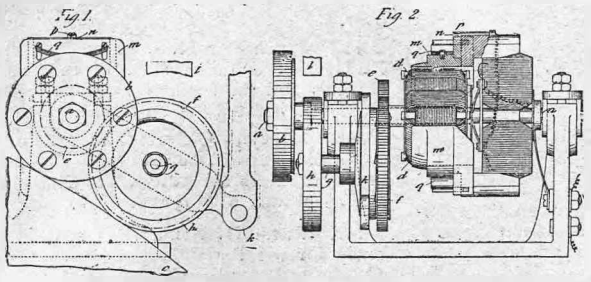
No. I.—The Piphornous.—This hardy little animal is found on all roads at all seasons, but is seen at its best during the summer. Though quite harmless, many people have a great dread of it. When pressed or in any way hurt it gives forth a sound like "pip-pip," from which it partly derives its name.

INVENTION.

THE LATEST IMPROVEMENTS IN MOTORS, MOTORCYCLES, MOTORCARS & ACCESSORIES.

A New Dynamo for Electric Ignition.

Messrs. Reid and Shepherd, 177, Sidwell Street, Exeter, have recently introduced a new dynamo, which, they claim, is self-governing at any speed, giving a continuous and non-varying voltage, and is thus perfectly adapted for firing the charge in gas or oil engines. Several of these machines have been constructed, weighing under 7 lbs. complete.



End view and part sectional view of Reid's Patent Self-governing Motorcar Dynamo.

They are enclosed in an aluminium dust-tight case with lubricator for motorcars, and are capable of furnishing sufficient current for starting and maintaining a motor engine of one or several cylinders as easily as with a battery, and giving a practically steady current for that purpose, as well as for lighting lamps, even at great variation of speed. There is also a patent appliance specially for charging cells, so that a storage cell can also be used (although not absolutely necessary). The dynamo is intended to be sent out to give a practically constant voltage of 5 (unless otherwise ordered), which the makers have found to be the most suitable for the purpose of working the coils, charging the two accumulators, or running the small side lamps. Fig. 1 shows an end view of dynamo, and Fig. 2 is a side view, partly in section, and the following is a brief description from the Patent specification :—The field magnet is fixed on the shaft (a), which is driven by a friction pinion pressing on the fly-wheel of the engine. The armature (d) is free on the shaft (a), and has on it a pinion (e), which gears with the wheel (f) and is used for starting only. The friction pinion (h) is the means of imparting speed to the armature, as in starting a motor engine, and is brought to bear with fly-wheel by a movable arm and removed from it when motor is started. As the arm is connected either to the compression tap or advance spark lever, it becomes practically automatic, the variation of speed when motor is running being entirely regulated by the revolving field magnets and its centrifugal pole pieces. If a battery is used in connection, no speed gear is necessary, as the battery starts the engine, while the dynamo charges the battery, or will run the engine without the battery when started. It is very easily fixed, as only two wires run from the machine to the battery. The dynamo acts as an automatic switch, and will only deliver current to charge, or for firing the engine when pole pieces are slightly diverged or when voltage is correct for that purpose. The contact parts are clearly shown at (n-p) in both figs. The machine is made with and without starting gear, at £4 and £5 respectively.

Crowden's Improved Motor-Bicycle, fitted with Driving-wheel on the Rail-ring Principle.

The illustration (Fig. 1) represents an old Wolfmuller motor-bicycle converted, to test the principle of the rail-ring tractor, as applied to cycles. This machine, which was originally driven by small back wheel direct, has now been substituted by a small heavy fly-wheel running in a rim without any spokes, held in position by two guide rollers extended with springs. The invention, the makers claim, overcomes the difficulties of driving direct, rendering the use of gears, chains and bands unnecessary. The arrangement also permits of great elasticity in running over rough ground and obstacles. The vibration of the engine and shock are not felt by the rider in any way, and with this driving arrangement a spring frame is not required. The machine was only adapted for experimental purposes; to test the system which up to now, the makers say, has given excellent results.

The rail-ring principle can also be adapted for the steering wheel and with the motor inside, and forming part of the rail-ring. The bicycle can be fitted with pedals, which permit of the engine being started or assisted if required.

Fig. 2 shows the action of the rail-ring in practice. (3) shows the rail-ring meeting an obstacle. It will be seen that the fly-wheel slightly runs up the incline of the ring, and the obstacle, displacing the centre of the ring,

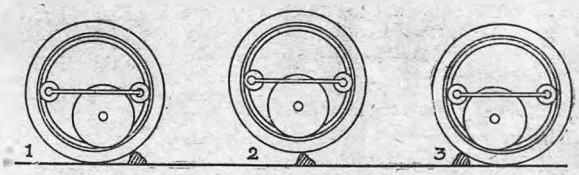


Fig. 2. Diagram illustrating Action of Ring Tractor.

behind the centre of the fly-wheel, this recoil being taken up by one of the guide roller springs. The force of the spring is given back to the rail-ring, which assists levering the fly-wheel to overcome the obstacle; (2) shows the rail-ring on top of obstacle and rail-ring again on centre of fly-wheel; (1) shows the recoil spring assisting the ring from the obstacle to the ground again

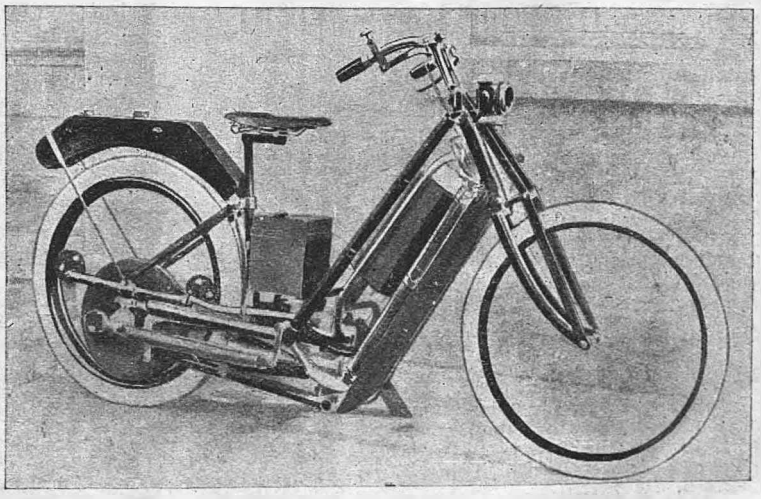


Fig. 1. Crowden's Rail-Ring Tractor Motor-bicycle.

NEWS.

"The Motor Manual."

Now ready and selling rapidly.

The best book on motorcycles and light cars.

It is said that the profit of the American Automobile Show amounted to £12,000.

It is stated that the number of visitors to the recent motor show at the Crystal Palace was 122,000.

A most interesting article on "The Future of the Light Car," by Sir David Solamons, Bart., appears in this issue.

Photographs of Mr. A. Winton and Mr. Henri Fournier, who will compete in this year's Gordon-Bennett Race, appear elsewhere.

"For the Tyro: Points About Selecting a Machine," will be the title of a most useful article for motorcyclists which will appear next week.

The "Motor Manual" is on sale at all bookstalls and at all booksellers at 1s. If readers experience any difficulty in procuring it we shall be glad to know.

We have a letter and a lengthy account from Mr. W. G. George, concerning the course of events in connection with the proposed track at Clacton-on-Sea. We shall be glad to give publicity to any ultimate developments.

For Feeding Railways.

The purport of Mr. J. Scott Montagu's paper read at the Automobile Club on Friday evening was to urge upon the Railway Companies the advisability of feeding the railways by means of motorcars, as they now collect goods by horse-drawn vans. This would enable more people to live in the country with greater economy of time and money. When not in use for the parcels of humanity the cars could be used for the conveyance of light parcels, etc.

The Trade, the Trials and the Shows.

At a meeting of the representatives of the motorcycle trade held at the Automobile Club last Wednesday, Ernest Perman ("THE MOTOR") in the chair, the following were elected to serve on the organising committee for the forthcoming Motorcycle Reliability Trials:—Messrs. E. H. Arnott (the Werner), S. R. Batson (the Bat), H. Belcher (the Humber), D. Citroen (the Minerva), F. G. Cooper (the F.N.), A. Goodwin (Ormonde), V. Hart (the Clarendon), J. A. Jackson (the Bradbury), H. Martin (the Excelsior), and J. van Hooydonk (the Phœnix). As the result of a discussion upon the advisability of the trade giving its support to more than one Show in each year, it was decided that the first step should be the consolidation of the trade, and the formation of an association, was then agreed upon, a committee consisting of Messrs. Arnott (to act as secretary), Belcher, Citroen, Dring, Edge, Garrard, Hooydonk, and Jackson being formed to take the initial steps.

DIO

Coming Events.

Feb. 19 Consumption Trial near Paris.
" 20. Mr. O'Gorman's Paper at the Automobile Club on "Motor-bicycles."
" 22 Automobile week at Pau. Races to and record attempts by all
" 28 vehicles.
" 27. A.G.M. of the Automobile Club.
Mar. 1. Competition for Silencers, in France.
" 13. Mr. W. Rees Jeffreys' Paper at the Automobile Club.
" 21. Motorcar Exhibition, Agricultural Hall.
" 29. Opening of the Nice Automobile Week:
Apr. 10. Eliminating Race amongst English Cars entered for Gordon-Bennett Race.
" 11. Test amongst American Competitors for Gordon-Bennett Race.
May 24. Paris-Madrid Race starts.

The Automobile Club has issued a form of petition to Parliament setting out the whole of the circumstances in connection with the Gordon-Bennett cup race, and praying for a special measure granting permission for the race to be held over a selected course in Ireland on an appointed day. The petition is being extensively signed, and it is generally thought that, as the difficulties are gradually being cleared away, there will be little doubt of the Government acceding to the request.

IN THE FUTURE.

Motorist at the Show of 2003: "Very interesting to look upon these relics of antiquity!"

Mr. Charles Barden writes to say he is prepared to accept the challenge issued by Mr. M. Fournier.

The entire issue of "THE MOTOR" last week was sold out completely. The number printed was 25,000 copies.

Owing to great pressure this week the third part of the article on "The Automobile Industry of the World" is held over.

The Manchester Show which opened on Friday last contains most of the motorbicycles and light vehicles which we have already illustrated and described.

Mr. Mervyn O'Gorman's article on motor-bicycles will be read on Friday evening next before the Automobile Club. We shall deal fully with it next week.

Mr. Ernest H. Arnott has sent in his entry for the Paris-Madrid race, and has also entered for the Circuit des Ardennes. Mr. Arnott will ride a Werner motorcyclette.

In the recent tyre trials the tyres which were awarded first and second prizes were fitted to Napier cars. This, Mr. S. F. Edge contends, is attributable largely to correct design in the car mechanism, which can save the tyres very considerably.

A Fine Ride.

A couple of De Dion-Bouton cars, one a 6 h.p., the other an 8 h.p., started from London on Wednesday morning last for Edinburgh, where Mr. W. J. Stocks, the manager of the company, had business to transact, choosing this way of reaching the northern capital in preference to aught else. The cars reached York, 200 miles, at 7.55 p.m., a little over 12 hours. Leaving York next morning at 7.45, Edinburgh (404 miles) was reached at 9 o'clock the same night. The riding time was 22 hours 40 minutes, giving an average of eighteen miles an hour all the way.

The "Powerful" Motor-Bicycle.

This machine is made by H. W. Clarke and Co., Gosford Street, Coventry. It possesses many good features, which should place it in the front rank of motorcycles for the coming season. A special point about it is the excellent "Buchet" motor made by the celebrated Paris firm which is fitted. This is of 2¼ h.p., has an outside-fly-wheel, and is fixed along the down tube. The carburetter is a spray with float feed. The petrol tank in the Model C is fastened behind the back forks, and in the Model D it is placed inside the frame. In this pattern the coil is placed in a compartment of the tank, and in Model C it is clipped to the horizontal tube. The accumulators are carried in a case behind the back forks. The transmission is by a V section belt. The frame is thoroughly well equipped with brakes, and the finish throughout is of a high order. The prices are: Model C, 38 guineas; Model D, 40 guineas, with two inch Clipper tyres.

The makers of the German built "Progress" motor-bicycle wish us to mention that they have just recently further improved their model by providing a single lever which regulates the throttle and lifts the exhaust valve. The compression tap has been discarded. The price of the machine has been raised to £36.

Westfield's Autobike.

Westfield's Autobike was dealt with in our first Show report. As will be seen from the illustration, it has a vertically-mounted engine supported in special lugs at end of main tube, and an extension tube from bottom bracket. The silencer is also of special design, claimed by the makers to be very effective.

Motorphobia.

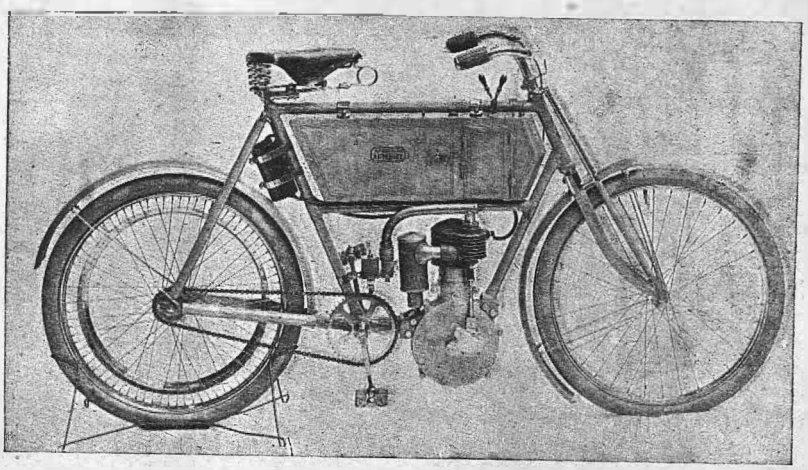
Miss Marie Corelli is said to have very strong opinions on motorcars. This is really distressing, but it would be difficult to find a subject on which Miss Marie Corelli does not hold strong opinions. It is safe to assert that even Miss Corelli's strength of opinion will be ineffectual in arresting the progress of the motorcar.

The Attachment of the F.N. Engine.

In addition to the clamp at the back of the truss, and which forms the main support, the engine is bolted through a flange on bottom bracket and there is also a steel stay which is adjustable, carried from the front of crank chamber to the top of the truss. The makers claim that this entirely prevents any possibility of the motor swinging, and the engine can be detached very readily if necessary.

Claims to be able to utilise Lost Power.

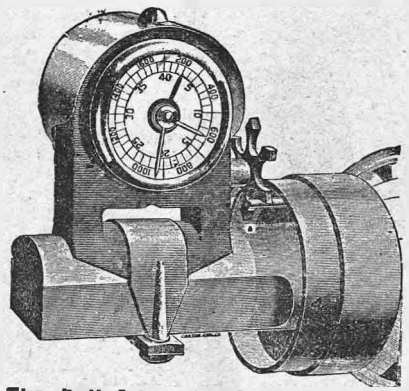
An inventor of the name of Herz, said to have been formerly connected with the Daimler Co., has produced a muffler or silencer which converts the lost heat from a petrol motor into electricity. Out of every hundred heat units generated in the motor only 18 are transformed into power, 17 escape with the exhaust, and 65 are carried away by the cooling water. The inventor utilises the 17 heat units lost through the exhaust and the apparatus he uses generates an electric current strong enough to light a head light, or it can be stored in accumulators for igniting the charge in cylinder.



Westfield's Autobike.

The Bell Odometer.

We give in this issue an illustration of the Bell Odometer, which was referred to in our "Show Novelties" page last week. It clamps on to the axle of the wheel and is worked by means of a pin which hits the star wheel in the same manner as a cyclometer, only the special point about this instrument is that a bell rings automatically at each mile or quarter of a mile, according to the model.



The Bell Odometer for indicating speed and recording distance travelled on motor cars.

Should the agreement between the Automobile Club and the National Cyclists' Union be ratified, the former will become the controlling body of the sport of motor-cycling. In any event, however, each body will be free to cater for such of its members who ride for pleasure only, whilst N.C.U. affiliated clubs will be free to promote the sport under the rules of the club.

The Weller Motor-bicycle.

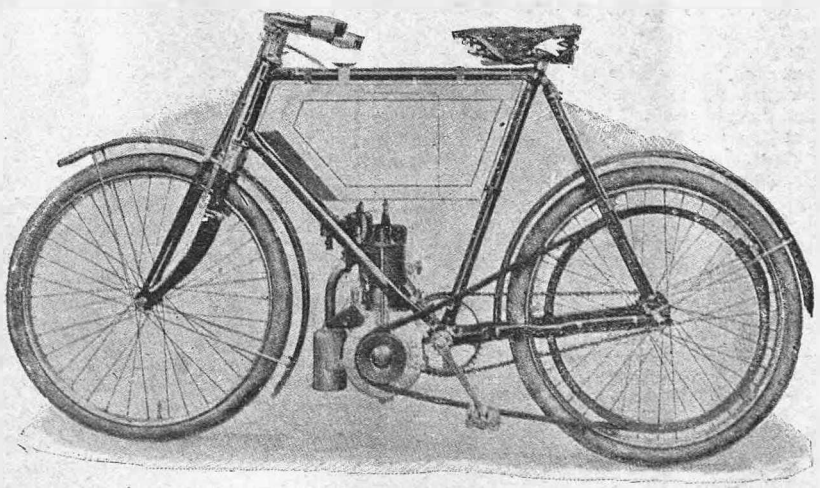
The motor-bicycle made by Weller Bros., of West Norwood, London, shown in the illustration, was briefly referred to in our last issue. The principal features about it are the vertical engine supported in a very rigid manner and the duplex front forks fitted.

A Private Testing Track

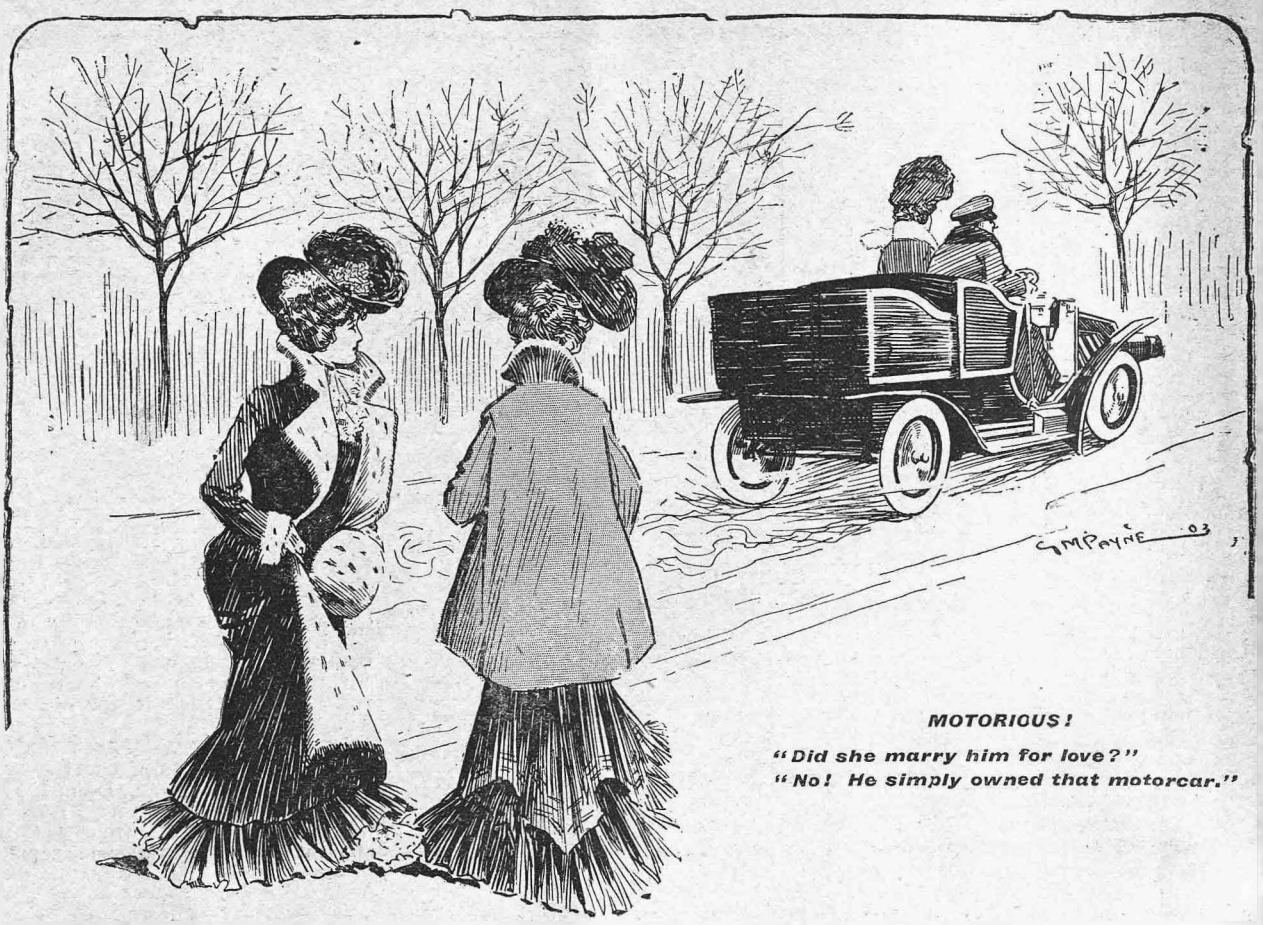
The Wolseley Tool and Motorcar Co. are building a car testing track on a large plot of ground facing their works at Adderley Park, Birmingham. It will be two laps to the mile and have numerous gradients; one will have a rise of 1 in 5. The course will be used for teaching clients' servants how to manipulate the cars before trying them on the road. The cars can also be tested up to their highest speed.

Why the Motor Didn't Start.

In a letter congratulating us upon our success and change of title, Mr. Chester Fox mentions one or two incidents he has experienced in his motor cycling career. The following is distinctly good. "A funny incident occurred only a week ago. Directly I started out on a 50-mile run, or, I should say, directly after, the firing stopped. I was apprehensive that my accumulator might run out in another 100 or 150, so produced a voltmeter, tested, and found nothing. It had run down with a vengeance. Of course, nothing to be done but re-charging. Took it round to be done, and left it with a boy, calling the next day. I happened to have a voltmeter in my pocket, a most unusual thing for me, and upon production of accumulator proceeded to test it—nothing! Inspected voltmeter, ascertained the wire had broken inside the vulcanite. Memory flashed back and sure enough I found I'd never turned on the petrol! The moral of this is, care and method. If you look after your horse he will look after you. If you get lax, he'll let you down."



The Weller Motor-Bicycle.



MOTORIOUS!

"Did she marry him for love?"
"No! He simply owned that motorcar."

A Public Benefactor.

The announcement that his Majesty has appointed a Royal Commission to enquire into the question of street traffic and its regulation, has been hailed with delight by many users of the road, and by none more so than by the motorman. It may be that there is a section of the road-using public bound down to an old-fashioned but happily moribund system of traction, which views with apprehension, rather than with approbation, any investigation of the traffic problem: any change must, so far as they are concerned, be for the worse—or so in their shortsightedness they think—either by forcing them into a more reasonable and businesslike increase of speed, or by driving them off the road altogether. But, speaking broadly, we may, without fear of contradiction, assert that the mass of the road-using public will welcome any code of laws which will ameliorate the present condition of things.

It is not our purpose, at this time, either to criticise the existing state of affairs or to suggest any regulations of an amendatory nature. What we have in view is, rather, to point out that the motor vehicle is, as suggested by the above title, directly responsible for this projected enquiry, this awakening of official energy. The motor, if it has done nothing else, has undeniably opened the eyes not only of the public, but (a feat incomparably more difficult of accomplishment) also of those in authority, to the urgent necessity for stringent traffic regulation. This fairly justifies our claiming for the motor vehicle that it is a public benefactor.

DI*

Keep off the Course!

With the object of avoiding the creation of opposition to the project for the Gordon-Bennett race to be run in Ireland, it has been decided that neither competitors nor club members shall drive over the projected course prior to the hour of the race at anything over a slow speed. Competitors who disregard this request will no doubt be disqualified by the countries which they represent.

To Prepare the Course.

The matter of putting the surface of the proposed route for the Gordon-Bennett Cup race into good order has taken definite shape, the Automobile Club having ascertained that, where the surface could be improved, it could be picked up and rolled in by steam rollers at a cost of about £10 per mile. It is proposed that the cost should be met by a general subscription amongst automobilists and sympathisers, and the Club has opened a list and invites subscriptions which, at the outset, are confined to 10s. per head. Such donations should be forwarded to the secretary, or a postcard making the promise of a certain amount would suffice for the present.

Oiling the Roads.

The Lord Mayor of Sydney recently stated that, since the experiments in connection with the laying of dust with oil in that city had proved successful, it was desirable that the municipal council should proceed further with the work. It was pointed out that by purchasing the oil in bulk a large saving could be effected.

Our Second Volume.

Cases for binding "MOTOR CYCLING" can now be obtained from our offices, 7-15, Rosebery Avenue, E.C. The price, including title page and full index, is 2s. 6d., post free. Readers may also obtain the index separately, 3d. post free. As the numbers in our second volume, with the exception of two, were issued under the style of "MOTOR CYCLING," we have retained that title on the volume, but future volumes will bear our wider title "THE MOTOR."

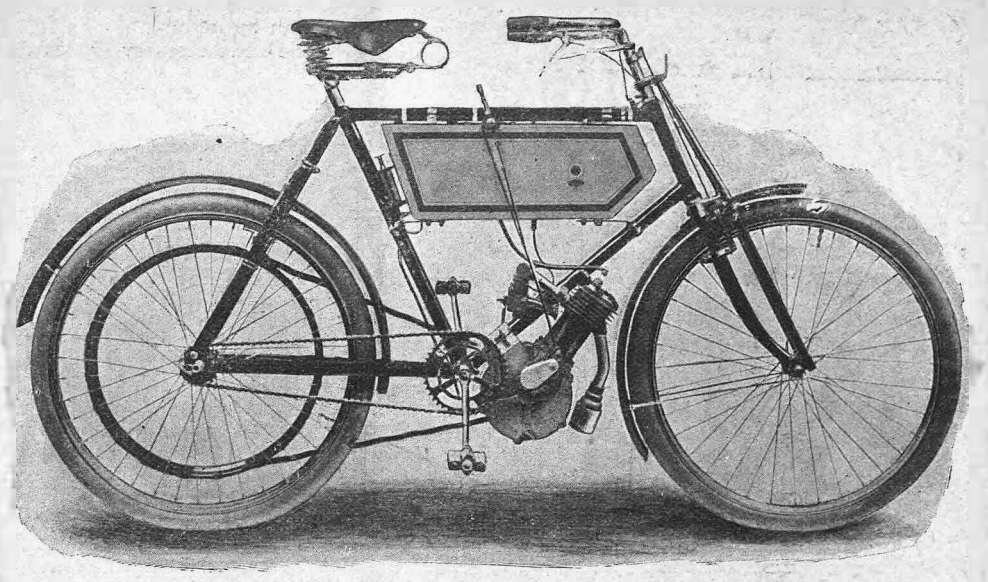
Another Suggested Gordon-Bennett Route.

So anxious are the Irish authorities to secure the holding of the race for the Gordon-Bennett Cup in their country, and each body in its own particular district, that new routes are being suggested. A fine one has been mapped in the county of Kerry, passing through the famous district of Killarney and on to Kenmare, Waterville, Cahirciveen, etc. The club will inspect the course and consider whether the route will be in all respects preferable to the one in Kildare. The latter has the great advantage of being close to Dublin.

A movement is on foot to form a motorcycle club for Brighton and district. A meeting of riders interested is to be held on Thursday next, February 19th, at 72 Marlborough Place, Brighton, commencing at 9 p.m., when a good attendance is hoped for.

Theft of Letters.

The Wilkinson Tyre and Tread Company, Chapel Hill Mill, Huddersfield, write us as follows:—We regret to inform you that we have had the letter-box at our Princess Works robbed periodically for the last few weeks, and we have succeeded in catching the alleged thief, who had on his person mutilated letters and cheques sent by our customers to us. We desire to intimate to your many readers that if they have not received answers to their inquiries it is because their letters have not reached us, and we shall greatly esteem further communication from them.



The Royal George Motor-Bicycle.

The Royal George Motor-bicycle.

This machine is a speciality of Messrs. Bransom, Kent and Co., 332, Goswell Road, London. It is designed on the standard Minerva lines, and is fitted with the 1903 2 h.p. motor, with mechanically operated inlet valve. The carburetter is of the spray type and the drive is by means of a belt. The frame is built up with an extra long wheel-base, and specially strengthened head and duplex forks are provided. The wheels are made with Westwood rims and special B.K. motorcycle hubs. The free-wheel is the well-known Hyde. The tyres are Dunlop motorcycle. Two brakes are provided, viz., a B.K. front rim and a Bowden back. The saddle is a motorcycle type with large springs. The mudguards are made extra wide and have adjustable links, to allow of the wheels being adjusted, and mudguards to follow the curve. Well finished throughout, the machine comes out at £45.

The opportunity has been offered by the Automobile Club to the Motor Cycle Union of Ireland and the Scottish Cyclists' Union to take over the control of motorcycling in their respective countries. If these bodies are not desirous of exercising such control, the Automobile Club will do so.

A Good Bargain.

In our light car issue of December 3rd we illustrated the 3½ h.p. New Orleans voiturette. We learn that the New Orleans Motor Company, Ltd., of Orleans Works, Twickenham, Middlesex, have a few of these voiturettes in the course of being finished, and that they will dispose of them for a hundred pounds each, when the pattern will be discontinued, the works being now devoted to large car work. These are capital little vehicles, driving by a belt and having two forward speeds. They are good hill climbers and all-round useful little vehicles, which may suit some of our readers, who should apply for full particulars.

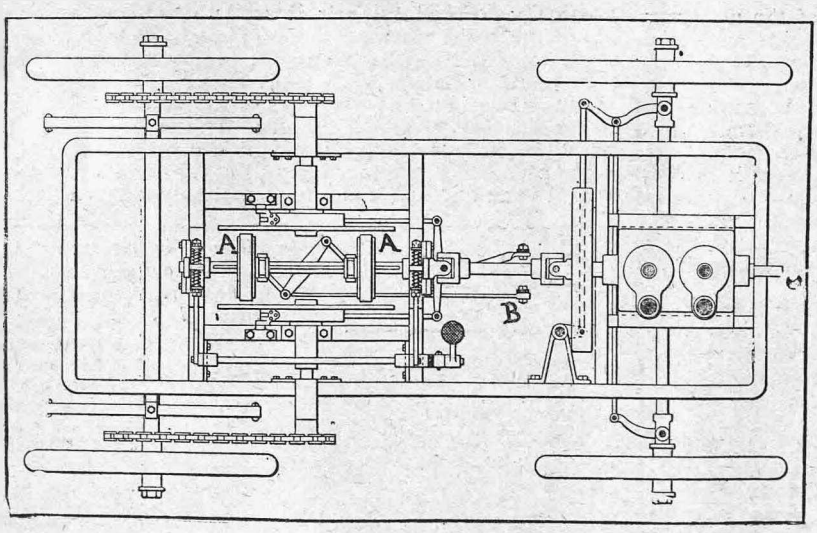
A proposal is made by Mr. Alfred Harmsworth in the current issue of the Automobile Club journal that a testimonial be organised and given to Mr. Claude Johnson when he severs his connection with the secretarial duties of the Club in the summer. Mr. Harmsworth offers himself to contribute fifty guineas towards such a project.

A Strange Opinion.

One of our contemporaries seems to hold the extraordinary opinion that the question of the manufacture of light cheap motor cars need not be entered into, as they are not practical. We suppose it will be time to enter into this question when the foreigner is here with the required article. Our own opinion is directly opposed to that of our progressive (*sic*) contemporary. Granted that past efforts have not been so successful as might have been desired, we say the light car can and will be made practical. The near future will give us a satisfactory result—from somewhere.

A New Form of Friction Drive.

The Marble-Swift Automobile Co., 1464, Monadnock Block, Chicago, have applied the system of transmission shown in the illustration to a motorcar. The special feature about it is that the usual method adopted in friction drives of driving off the disc is reversed, the drive being transmitted from friction rollers (AA). These slide along a longitudinal shaft which is capable of a certain amount of play, so that by means of a system of levers the roller shaft can be placed in a slanting position and cause the rollers to engage the discs on opposite sides. Any speed can be obtained by means of a speed changing lever (B), which causes the rollers to move along the shaft towards the centre of the discs. To obtain a reverse drive the slant of the roller shaft is simply reversed. Instead of the rollers being covered with raw hide or leather a hard paper surface is used and the discs are made of cast iron. Any speed from one to thirty miles per hour is claimed for this device.



A new form of Friction Drive, explained on this page.

The Motor
INCORPORATING Motor Cycling & Motoring

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

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OPINION

The Formation of a New Motor Trade Association.

The motorcycle trade was well represented at the meeting of its members called together by the Automobile Club for the election of part of the organising committee for the forthcoming motorcycle trials. But when the room was entered no one had any idea that such an important step would be taken as the formation of a trade association. The idea was a spontaneous one; the discussion which had taken place upon the vexed "Show question" very plainly indicating the need for co-operation and joint action by the trade. Starting in this way is a happier augury for the future of the new body than if it had been slowly germinated, and too many of the difficulties which are bound to beset its path had been foreseen. The initial step having been taken, these difficulties will be tackled in a different spirit and are more likely to be overcome than if they had been considered as insuperable.

The light motor vehicle trade is young, but it possesses the rare qualities of energy and of knowledge gained from operations in the cycle trade. It has also the advantage of having observed the earlier difficulties of the motorcar trade and the methods that have been adopted to overcome them. The new association therefore starts its life with an open career, before the trade which it represents has become entangled by diverse interests and there is, consequently, nothing to prevent it from becoming the backbone of the industry. Whether it is to be permitted to fill this important role depends entirely upon the support given to it by the trade and we hope that no one will stand aloof who hopes to see the light motor trade in a flourishing condition, free from those abuses which have cut up and wrecked many an industry; nor will any one who desires his own welfare in connection with that trade.

Just one word of warning to the association is justified. Let it be remembered that there is no active sympathy between the makers of costly cars and the makers of motorcycles, because they appeal to different sections of the public, and let the association steer its own course, resolutely refusing to be taken in tow, patronised and swamped in the wake of big craft. The Crystal Palace Show should be a warning to the light motor trade. There the light motor instead of being the thing which the public was asked to come and see, had to play second fiddle to cars worth ten times their price, to play second fiddle to such a tune is equally as bad for an industry as for an individual. The title at first given was the "Motor Cycle and Accessory Trades' Association," this was amended to the "Motor Cycle Trades' Association," but it is obviously advisable that the title chosen should be one which will limit neither the association nor its members, and which will not hold them in check when the trade develops. We would suggest that the new body be termed the "Light Motor Trades' Association,' which accurately describes the particular branch of the trade it represents, but does not tie its members to one form of light vehicle only. Other points which call for attention in connection with the scope and the objects of the new association will be dealt with in subsequent issues.

Facing Both Ways.

Ingenious attempts are being made in some directions to show that cycling and motoring are practically one and the same thing. While admitting that the two recreations have something in common, we think the underlying object of such an opinion is very obvious, and that the subject has been dealt with in too laboured and tedious a style for its sincerity to be genuine. Our own views on this subject have been made clear, and our readers must be aware that we are adepts at neither fence-sitting nor facing both ways in this matter. The difference between cycling and motoring whether motorcycling or motorcar driving, is really very clearly defined. One is an athletic pursuit, the other engine driving. Astute arguing through wearying columns of hypothetical verbiage will prove nothing in contradiction of this fact. When a man drives a motor vehicle—it may be a cycle or a car—he participates in a pastime known as motoring; and he is a motorist. Where the close connection really does exist is between the motor cycle and the light motor vehicle on three or four wheels. The motorist who learns the motor-bicycle gains a fair elementary knowledge of car driving, and the possibility is that he will in time pass on to the more ambitious vehicle. We have already evidence of the real trend of events in the fact that the National Cyclists' Union have handed over the control of motorcycling to the Automobile Club, and that the latter body are intent upon the proper governing of the sport in common with automobilism generally.

With this in view we again describe as ingenious the efforts that are being made to prove that there is an indissoluble bond between the athletic pastime of cycling and the purely mechanical recreation of motoring. The real tendency is for the two to drift farther and farther apart, and any attempt to cater for the participants at one and the same time is not consistent either from the point of view of users or the trade. Nobody is in a better position than ourselves of knowing that cyclists actually resent the inclusion of purely technical motor matter in a journal nominally devoted to their interests. Evidence has been abundant in the case of "Cycling," and the motor matter in that journal has been reduced to the merest precis of actual motor news, with the result that "Cycling" may now be said to be the only wheel paper issued exclusively in the interests of actual cyclists. The policy of running with the cyclists and hunting with the motorists may be a comprehensive one to attempt, but it should be obvious that it is an impossible one to consistently conform to.

THE IDEAL LIGHT CAR.

Numbers of people who visited the Crystal Palace Automobile Show went in search of the ideal light car, and in the following article Mr. Walford gives his views of some of the requirements to be looked for in a vehicle of this type.

The term "light-car" is generally held to mean a car weighing about 15 cwt. with full touring body, the definition being that of its racing class. A racing car to be of the "light car" class must weigh less than 650 kilos. (about 13 cwt.) in racing trim. After the race the manufacturers fit touring bodies, tyres, etc., bringing the weight up to about 15 cwt. and sell them to the public as "light cars." The cars, as a rule, are very fine pieces of workmanship and cost anything up to £1,000, and for the latter reason can hardly be called "ideal light cars."

In the ideal car about to be described the definition of "light car" to be taken is not the one given above, but that given in an Editorial in "MOTOR CYCLING" of December 31st, 1902, and I have also gone further to describe a four seated car. It is generally admitted that what is required is a car having an engine of 4-5 b.h.p. with two seats, or of 7-8 b.h.p. with four seats. The smaller engine will be single-cylindered and the larger one double-cylindered.

Popular opinion says that the engine must be placed in the front of the frame, where it is easy of access and

TENDS TO REDUCE LIABILITY TO SIDESLIP.

The ideal light car must, therefore, have its engine in this position, or show good reason for having it fitted elsewhere. The frame will be single and tubular for the two-seated car, and of channel steel for the four-seated car; or a tubular frame might be used for both types. For the heavier car the frame would probably have to be trussed on each side to give the necessary strength and freedom from bending, which occurs with tubular frames of any great length.

The axles are to be tubular, or, if they were too expensive, solid ones of round cross-section would have to be used, wire wheels being employed for the two-seated car and artillery wheels for the four-seater. The wheels of both cars are to be about 32 in. in diameter and be fitted with 3½in. non-skidding and non-puncturable tyres. Long springs of the usual semi-elliptic type carried on dumb-irons at one end and links and scrolls at the other, support the frame.

The engine is air-cooled, the single cylinder being vertical and the two cylinders at the angle of 30 degrees to one another, the two pistons acting on the crank, with common crank-ca e.

Since the cooling of the engine is so important, a few words on the construction of the cylinder and the method of cooling may not be out of place.

The cylinder is steel, and very thin, perhaps wire-bound, as in gun construction; it has broad, thin copper flanges shrunk upon it. These flanges are not to be placed too close together, but are to be corrugated and perforated. Forced draught, induced by a high-speed fan, is to be used, the fan to be driven from the crank shaft, so as to be in operation whilst the engine is running.

AIR-COOLING IS SUCCESSFUL

on the Lanchester cars and on many American cars, and there is no reason why, if forced draught is employed, it should not be used on light cars generally; moreover it saves the weight and expense of water, pipes, tank, radiator and pump, and their attendant troubles, which form 30 per cent. of the motorist's worries. However, the time will come when all external cylinder-cooling will be obsolete; a less wasteful method being employed. It may possibly be on the following lines:—

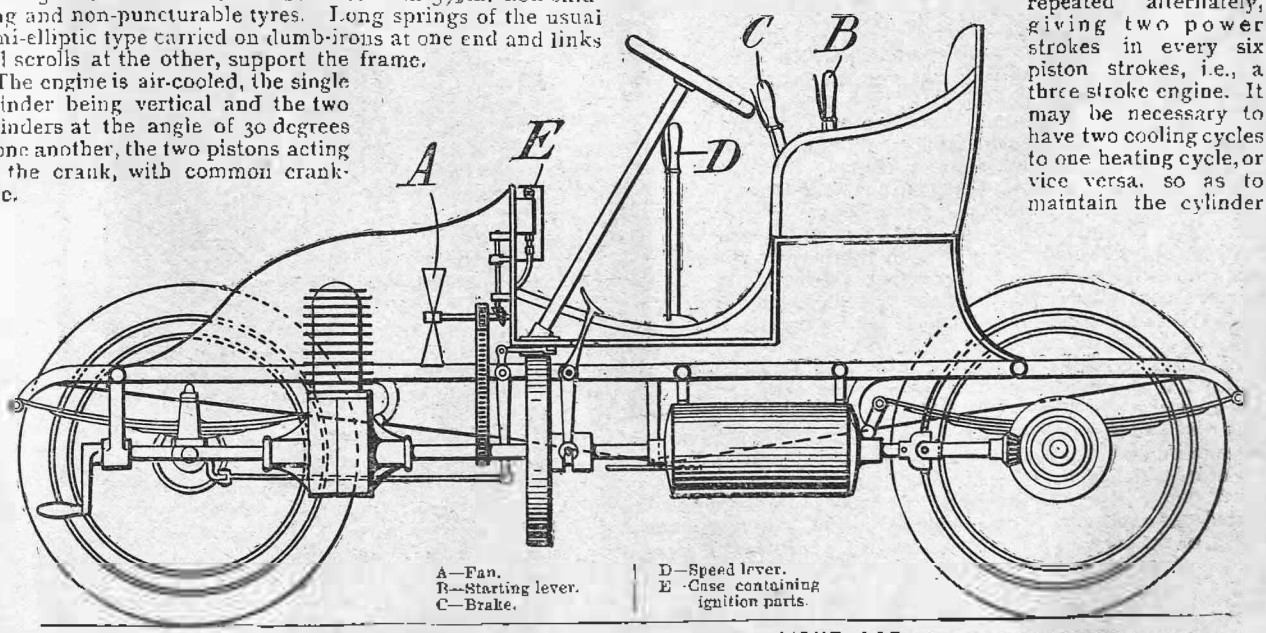
The cylinder to be jacketed with wood and asbestos lagging, in order to retain all the heat; the engine working on the following cycle:—

1st down-stroke—Suction of gas as usual.
1st up-stroke—High compression.
2nd down-stroke—Combustion.
2nd up-stroke—Exhaust.

The engine will now be heated and will require cooling.

3rd down-stroke—Injection of a drop of water on to hot cylinder walls. Conversion of water into steam, which drives down the piston.
3rd up-stroke—Exhaust of steam.

After this the ordinary Otto cycle and "water" cycle are repeated alternately, giving two power strokes in every six piston strokes, i.e., a three stroke engine. It may be necessary to have two cooling cycles to one heating cycle, or vice versa, so as to maintain the cylinder



A—Fan.
B—Starting lever.
C—Brake.
D—Speed lever.
E—Case containing ignition parts.

DIAGRAM OF THE SUGGESTED IDEAL LIGHT CAR.

at about the same average temperature as at present. This method

UTILISES THE NECESSARY COOLING FOR POWER GENERATION,

the cylinder constituting alternately a gas engine and a flash generator, and may result in a lighter engine of given power than is at present obtainable.

At present the lightest engine is the air-cooled one, so we must be content with using that. The engine has one or two inside fly-wheels and one external one of larger diameter and lightest weight possible, the hub of which contains an expanding clutch transmitting power to the gear-box, which is, of course, of aluminium.

The gear-box is carried upon two tubes, bracing the frame just beneath the seat, and contains sliding gears to give three speeds forward and reverse, the drive from the gear-box being by propeller-shaft to the rear live axle, with radius rods running from the cross-braces to the axle. The gear-box is to be readily detachable in case of need.

All bearings should be plain, with lubricating rings dipping into oil-boxes of large dimensions, the supply to which must be controlled from the driver's seat, from sight-feed lubricators on the dashboard, operated by exhaust pressure; similar lubricators supplying the crank-case.

The clutch is adjustable and operated by the left pedal; the usual brakes are fitted, all of them being of the expanding type and of large diameter, provided with adjustments.

The two-seated body of the bucket type is made of aluminium and will form the petrol reservoir in the part above the seat, which constitutes the back and arm rests, a protected gauge being in the centre. The front seats of the four-seated car are to be of the same type, and the rear seats being in the form of a detachable tonneau with small overhang. In either car the body must be made to slide on the frame and leave the gear-box exposed; a union on the petrol pipe allowing for this By building the tank in the body, room is left beneath the seat for tools, parts, etc., but jack, oil-cans and similar clumsy articles are to be carried beneath the bonnet in recesses made for the purpose.

The ignition will be electric, the cells, coil, charging dynamo and contact-breaker being

UNDER ONE GLASS-CASE ON THE DASHBOARD,

which necessitates only one wire, i.e., sparking-plug wire going to the engine, the rest being under the observation of the driver. Perhaps a high-tension magneto will take the place of the accumulator system, in which case the magneto will be under the glass-case on the dashboard, with a "tell-tale" to show if it is operating and sparking properly.

The speed-lever, fitted with a catch to automatically withdraw the clutch, is at the side, near which is the starting-lever; a long lever connected up to the engine by chain, or otherwise, to enable starting to be effected from the seat; the ordinary starting-handle is retained for testing purposes.

The single cylinder is hand-controlled by a throttle in the induction pipe, and the lever being on the wheel or steering pillar. The double cylinder is automatically governed on the throttle with pedal accelerator, an automatic spark-advancer being fitted in both cases.

The withdrawal of the clutch by pedal (but not by speed-lever) throttles the engine; the return of the clutch opening the same. The rear of the two-seated body forms a platform for luggage, which can be obtained in the four-seated car by removing the tonneau.

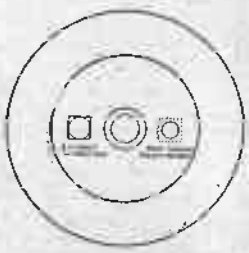
Many little refinements can be fitted to the ideal car which add to the accessibility, including the use of butterfly-nuts on the valve yokes and other parts which often have to be examined; the employment of large inspection doors to the crank-case and gear-box, the doors being held in place by butterfly-nuts; the fitting of drain-taps to petrol tank and gear-box and crank-case, and last, but not least, an oil-tight gear-box. The weight of the ideal two-seated car should be about 5-6 cwt., and the four-seated car about 8-9 cwt.

ERIC W. WALFORD.

CYCLOMOT'S CAUSERIE.

Removing Small Pulleys.

A couple of readers have sent me letters detailing their methods of detaching the small belt pulley from the engine axle. "F.W.F.," of Kingston-on-Thames, finds the following to be a good way. Remove the belt and leave the compression on. Tighten a spanner on the nut which locks the pulley on; turn until the full strength of the compression is felt, and then give the spanner a sharp tap with a hammer. A sharp blow, says this correspondent, will frequently move a nut when a steady strain will fail. Then place a metal wedge on one side of the pulley and between it and the crank case, and then shift the pulley by driving a thin wedge in between the case and the other side of the pulley. This puts a square strain on the pulley and there is little or no liability to crack the latter. Personally, I prefer to use a wooden wedge, as with metal wedges I find that it is difficult to avoid chipping the edge of pulley.



Another correspondent, "C.H.S.," of Plympton, Devon, sends me a sketch, which I reproduce, showing a couple of holes drilled in the face of the pulley and tapped for quarter-inch bolts. When it is desired to remove the pulley, the bolts can be screwed up to the face of the crank chamber, thus forcing the pulley away. The defect about this and the other method described above, is that undue strain is brought to bear upon the internal bearings of the motor; the axle being pulled over to one side until it can go no further, then the pulley parts company with the axle after sundry blows have been given. The pulley extractor of Lake and Elliotts, which I had an opportunity of experimenting with the other day, is free from this defect. The pulling jaws grip the groove on each side of the pulley, and the forcing screws bear against the ends of the motor axle, so that there is no strain between the latter and its bearings in the crank case.

More Unpleasant than Dangerous.

Something which I really hate and detest is grease, and I suppose that few votaries of our pastime bear any different feeling towards it. Bad luck took me last week-end (as I write) into a mud-covered zone, and for two hours we, my companion and myself, plugged painfully along, cautiously picking out the parts where the liability to side-slip was least, keeping to the crown of the road when circumstances allowed, but generally following in the smoothly-rolled track of the cyclists and departing from it with muttered execrations when a vehicle had to be passed. We had sixteen miles of it before we were practically done with it, and three times had we dismounted and surveyed the roadway with sorrow and distrust icily gripping our hearts. Cyclists passed us in droves; other motor cyclists occasionally went steadily by, and now and then some passed us at a speed which made us envy their pluck. Cars were out in scores and the sway of the rear portions only increased our own personal anxieties. A dampness amounting almost to an attenuated drizzle was in the air. We reached practically the limit of our outward peregrinations, and it became necessary to turn again for home if we wanted to be back in time for the midday meal. But neither of us was willing to return over the outward route. There was only one alternative way and that was to go on for another two miles, turn off and drop down into a valley and take that way home. This meant passing over one road which is rendered very slippery by a little rain in summer-time, and the other roads were largely used by traffic, so that there was every prospect of them being quite as bad as those we had already traversed. But, thought we, as they could not very well be worse, and as we were willing to face the unknown danger rather than the known, we chanced it and took the alternative route. For the first half-mile it was awful; then it gradually grew better. The hill which we must descend and which we had guessed would be simply unrideable, we found to be practically dry and we did nearly thirty down it! Dry patches appeared, grew more numerous and more lengthy, and then we struck the road usually so bad in any wet weather. It was in splendid condition and only in two or three places under trees was careful steering demanded. We turned southwards for our run through the valley, and one would have been justified in asserting that no rain had fallen for over a week. Then we made up for lost time and whereas the outward sixteen miles had taken over two hours, the homeward sixteen or more (the return route being slightly longer) was done well inside the hour. The distance between the parallel roads—one saturated and greasy, the other quite dry—was less than five miles. My hands and wrists and forearms ache even now with the strain of steering through the grease, and yet I am fain to admit that never a side-slip took either of us. I felt my rear wheel "slither" on two occasions, but only for a few inches, but there was that wretched distrust present the whole time. The outcome of a knowledge of the danger, this distrust is infinitely worse than the danger itself.

A Broken Trembler.

A curious little fault brought the Minerva to a stop the other day. The machine had been travelling well, and in passing over a piece of rough ground firing became irregular and finally ceased entirely. The atmospheric conditions were bad and extremely changeable, so the mixture was experimented with, but there was never a ghost of an explosion. The battery showed a full four volts on the meter, and the wiring seemed to be in perfect order. All connections were tried, and the contact breaker was tested. The spark was there, but somewhat feeble. The motor could not be induced to fire, so the petrol was tested, the valves examined and the wiring searched for short circuits, and everything found to be right. The plug was good. So the fault was narrowed down to the contact breaker again. The platinum screw was adjusted, but in the next trial there was no result. A new plug made no difference, and the mystery now became acute. Finally, the trembler was detached, in order to have the pittedness of the platinum stud removed, and as it was taken from its position it fell apart, being broken across the place where the platinum stud was riveted. A new trembler was fitted, and the motor then tried. It fired three times and then stopped. This time the plug was examined, because I had noticed, in putting in the new one, that the points projected rather a long way. These were found to be in actual contact, so a different make of plug was used, which would be free from this defect, and the motor started straight away and travelled splendidly for the rest of the day. This is the first time I have ever had a trembler break, and so it had taken rather a long time to find the defect, even though it had twice been located at the contact breaker. But we live and learn and profit accordingly.

[21]

OTHER PEOPLE'S VIEWS.

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.

Concerning the Ariel Tricycle.

Sir,—We read with very great interest letter from your correspondent, Mr. C. May, in last week's issue. This gentleman is apparently not aware that the "Ariel" tricycle and quad embody numerous registered designs and pa ents which have been duly fully protected. In the event, however, of any firm wishing to manufacture tricycles and quads on the same lines as the "Ariel," we invite correspondence, and should be very pleased to arrange terms for their manufacture under license.—Yours faithfully,

E. HERINGTON, Secretary,
Ariel Cycle Company, Ltd.

Ariel Quad in Trouble.

Sir,—In reply to F. M. Mansfield in a recent issue, *re* above, may I suggest that the petrol in the bottom of carburetter may have been stale from long standing, and that the simple admission of fresh petrol and agitation by the float rod would have remedied the trouble. In cold weather it is always advisable to let fresh petrol run into carburetter to start with, and agitate it well. I have run an Ariel trike for the last four years, and find that the surface carburetter supplied with same is as good as anything else going. Excepting in cold weather, when I have to do as above recommended, the motor starts right away. A smart push off, in with the exhaust valve, and off the machine sails. This old Ariel trike will climb very steep hills, can do thirty miles an hour on an ordinary flat road, and is economical as to petrol. It gives me more fun than my car. I simply mention this, as I was told when I bought the machine that it would be better to wait and see what improvements were coming on. My advice to those thinking of going in for motoring is—to paraphrase a certain humorist—if you have any motoring to do in the future, there is no time like the present; you never get younger.—Yours faithfully,

ALEX. G. MOFFAT.

D22

Wind Resistance.

Sir,—In an issue of "THE MOTOR" some weeks ago I noticed some figures and advice given by "La Locomotion" to makers of motor vehicles, which struck me as being not quite correct, and trust this letter may not be out of place, as such an important factor as wind resistance needs due consideration. The figures below are obtained from books by Molesworth and Trantwine, also as quoted by you, in which you will see that, even if "La Locomotion" intended it to be per square foot, and not inch, they would be quite incorrect:—

—	Resistance per sq. foot.		As quoted by "The Motor."	
Speed miles per hour.	Molesworth.	Trantwine.	Lbs. per sq. inch.	Reduced to lbs. per sq. foot.
5	·12	·12	—	—
10	·49	·50	—	—
15	1·10	1·12	—	—
20	1·96	2·00	—	—
25	3·07	3·12	—	—
30	4·42	4·50	65	9,360
50	12·30	12·50	—	—
60	17·71	18·00	115	16,560
80	31·48	32·00	—	—
85	—	—	210	30,240
95	—	—	300	43,200
100	49·20	50·00	—	—

What would a locomotive do against a wind of thirty miles an hour, which Trantwine calls a "Strong Wind" (even if it had no train to pull) should the pressure be 65 lbs. per square inch (over four tons per square foot) on the front of the engine?

I have just worked out the area opposed to the wind for a motorcycle and its driver in rough figures. It seems about five square feet (when sitting upright), but Trantwine estimates the resistance of a cylinder at half that of its real area opposed to the wind. I add this because one might call the area of a rider opposed to the wind as composed of a number of cylinders (such as head, arms, body, legs, etc.) This would reduce the total area of five square feet to 2½. When working out the opposing pressure on a motor don't forget to add speed of motor to wind if it is dead against you.

One example will make quite clear what I mean: if one is riding 15 miles per hour against a 20 mile wind, the result is 35 miles per hour for wind pressure, which equals about 6 lbs. per square foot by 2.5, or 5, say a mean of 3.5, equals 21 lbs. pressure. This can easily be imagined by supposing a weight of 21 lbs. connected by a wire over a fixed pulley on the edge of a cliff. Under these conditions we must add riding 15 miles per hour with a wind of 20 as above, and so raise the 21 lbs. weight.—Yours faithfully,

H. J. WINTON.

OUR DEPOSIT SYSTEM.

An increasing number of readers are utilising this safeguarding system in selling second-hand motors and accessories, and we wish to again emphasise the point that it is better to remit us notes or money orders in preference to cheques, as the latter take two or three days to be cleared and we cannot advise people to forward articles until cheques are credited to our a/c.

Re Spray Carburetter Troubles.

Sir,—After several stoppages, I have found that the petrol contains a thick oil in very small quantities, about ¼ oz. per two gallon tin, and its peculiar properties are such that, with a large spray jet, it does not cause trouble, but with a small spray it corrodes and gradually stops up the spray. The way I found the oil was present was by electrical evaporation in the open air for safety. The temperature was at freezing point. The method I adopted was this:—I simply took a large glass funnel, put a small cork in the bottom, and then two lamps (electric) in the funnel, switched on the current, and filled up with petrol until I had evaporated two gallons. When all was evaporated I found the thick sediment remaining in the bottom of funnel.—Yours faithfully,

HENRY KENNETT, Jun.

Sir,—I see from a recent issue of "THE MOTOR" a letter in "Other People's Views," from Mr. H. Davies, giving his opinion on the surface carburetter, and saying that the worst point about a spray is its complication, and I should like to point out to your corespondent the fact that a spray cannot be complicated, considering it is possible to combine it with the inlet valve.

He then goes on to say that he will guarantee only about ten per cent. of motor-cyclists are able to take a spray to pieces and put it together again properly. I am very much afraid the remaining 90 per cent. would not accept the fact that they were so inexperienced, considering the other complications they have to meet with in a motorcycle, and I am sure if all sprays were as simple as mine there would be no difficulty in putting together, the principle of working being a thin disc with a needle valve attached underneath and in the centre, the disc being pressed down by a very weak spring, so that the suction from the motor raises the disc, thus opening the valve and allowing the petrol to spray round the disc. Of course, I do not wish to say that all sprays are like mine, neither do I wish to say all surface types are like your correspondent's, but my opinion is that a spray carburetter combined with the inlet-valve is a step towards simplicity itself.

Wishing your excellent paper every success.—Yours faithfully,

FRED. W KING.

323, Tiverton Road,
Bournbrook, Birmingham.

Are Pedals Wanted?

Sir,—Having read with a great deal of interest "Cyclomot's" article *re* "Pedals: Are they Wanted?" which appeared recently, permit me to express my views on the above subject. I don't think the average motor cyclist is sufficiently acquainted with the working of his motor for pedals to be dispensed with altogether, especially as a simple and effective swing crank is being put on the market by Collier and Sons, Plumstead. With an arrangement like this one, I feel sure the majority of motor cyclists will feel more comfortable should the motor stop and refuse to start, than if there were footrests only. Trusting I have not trespassed too much on your valuable space.—Yours faithfully,

W. BRIAN.

Sir,—With reference to "Cyclomot's" article in "THE MOTOR" *re* the above. I think the answer depends entirely on the efficiency of the engine employed. I enclose particulars of a suggested starting arrangement for free engine of motor-bicycle, which (if motor is capable of doing all that is required of it) should allow of a comfortable pair of footrests in lieu of pedals. A good change-speed gear is, of course, a great advantage when pedals are dispensed with, and this could be combined with clutch if desired.

The starting handle, which is quite small, and can be easily carried in the pocket or tool-bag, is inserted in belt rim, which is shaped to receive same in any position.

When engine starts the belt will immediately raise starting-handle off rim, and all that remains is to throw clutch in and out as required.

I consider "THE MOTOR" excellent, and, for the man that really wants to know, it is by far the finest publication in the line.—Yours faithfully,

FRED G. GARDINER.

Condenser for Coil.

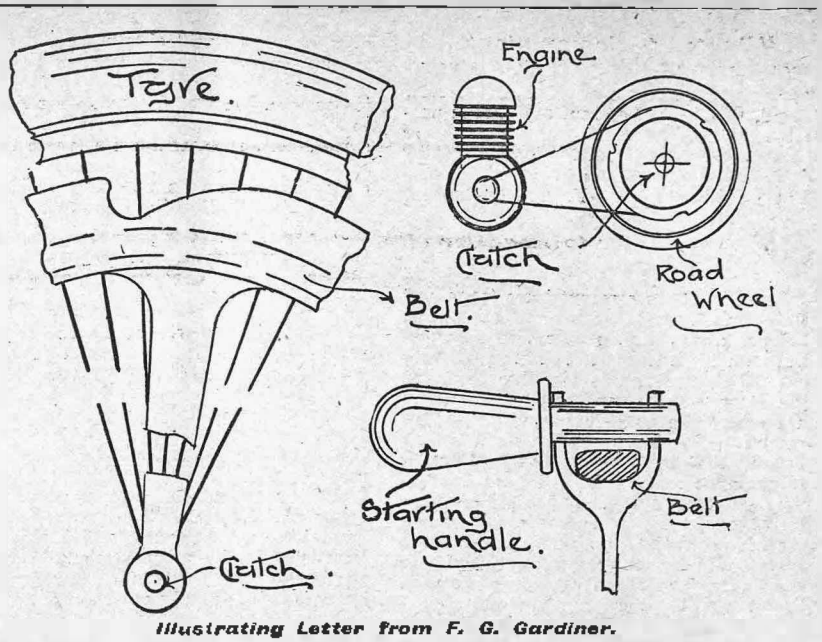
Sir,—I was very much interested in Mr. M. O'Gorman's article in your valued paper recently. I desire to follow out his ideas on my motor which I am making, but am not quite clear how to wire up so as to insulate entire circuit. I should be much obliged if Mr. O'Gorman could supply a diagram of the wiring, as I think it would be of great assistance to myself and other readers who are interested. Also, with regard to separate condenser, does that mean having a coil with no condenser, but to use a separate condenser connected up as described?—Yours faithfully,

"MECHANIC."

Three-wheelers and Side-slip.

Sir,—I have seen in a recent issue some remarks about side-slipping of three-wheel cars. I have been driving an 8 h.p. Eagle tandem lately, and have not been troubled with sideslip at all. In fact, I think this type of car slips less than any other on a flat road; but some difficulty is found when the road is arched, as the driving wheel has a tendency to slip down to the edge. But I think the great disadvantage with this car is its want of adhesion to the surface on greasy roads. I find that on even slight hills the driving wheel spins round, and on one or two occasions I have had to help the car up a stiff hill, the car having come to a standstill, with the driving wheel spinning round at a great pace. The running of the car is all that can be desired on a dry day; but in the wet it has this great disadvantage. I should like to know if any of your readers could tell me a way of stopping this trouble. From looking at "Another Mechanic's" design for a light three-wheeler, I cannot see how this would work, as it is not fitted with a two-speed gear, and without this an engine of only 2½ h.p. would hardly be able to start the car; also the absence of springs from the seats and footboards would make riding in it very unpleasant.—Yours faithfully,

H. STANLEY.



Illustrating Letter from F. G. Gardiner.

Century and Eagle.

Sir,—Mr. J. M. Kenworthy's letter in your issue of the 28th instant is a very clever attempt at defending the Wick carburetter, which we formerly used, when known as the Century carburetter, but have discarded, as already explained, in favour of one which develops more power with greater economy. We think, however, that all intelligent readers will see in it nothing more than a red herring drawn across the trail, and an attempt to build up the Eagle house with Century bricks. We have always made public the fact as stated in our recent letter, that the carburetter in its original form was invented by Mr. Jackson whilst in our employ, and owned by him and our Chairman, Mr. A. Firth, conjointly. When no longer of any use to this company, Mr. Firth, in October last, sold his share in the patent rights to Mr. Jackson, and naturally enough the Eagle Company, who now employ Mr. Jackson, desire to turn this patent (which they appear to have purchased from Mr. Jackson at the time we discarded it) to best account. They omit, however, to state that the carburetter in its original form was of very little use except for 2¾ h.p., and that considerable alterations and improvements had to be made by us before it could be used for our 5 and 6½ h.p. Century tandems. Another point which good sportsmen would naturally expect the Eagle Company to mention with regard to the Welbeck and Bexhill races to which they refer, is that they ran on each occasion a racing machine fitted with an 8 h.p. engine, against our ordinary pattern roadster, fitted with standard gearing and a 6½ h.p. engine. We have not had the pleasure of meeting an Eagle tandem in the Glasgow Trials, September, 1901, September Trials, 1902, or in any Automobile Club competition, nor do we know that they have yet done with an ordinary 6½ h.p. roadster 50 miles non-stop in 1hr. 30min. 12 3-5th sec., or 100 miles, with a ten-minutes' stop for tyre troubles only, in 3hr. 6min. 23 2-5th sec., which the Century has done, officially timed by Mr. F. T. Bidlake.

With regard to Mr. Kenworthy's remarks *re* alleged plagiarism on the part of the Eagle Company, we think we cannot do better than let the public form their own opinion, remembering that the first Century tandem was built in 1899, and that the first Eagle appeared early in 1901. We enclose a photo of 1899 tandem, and ask you to compare it with the present Eagle.—Yours faithfully,

ARTHUR W. HEARD,
The Century Engineering and Motor Company, Limited.

[Both sides having had a hearing in this matter, the correspondence is now closed.—ED.]

Quad or Light Car

Sir,—With reference to the letter from Mr. Victor Riley on the above subject, he says I have a wrong impression as to cost of upkeep being less than that of the light car. When I said quads are not so expensive as light cars in their upkeep, I had in my mind two things—tyres and petrol—these two items being the most important and constant expense. Other parts, such as transmission gearing, brakes, water-cooling, etc., are practically nothing if properly looked after. It is marvellous the amount of wear they will stand. At any rate, this has been my experience with the Ariel quad. Referring to "Vernon's" letter in the same issue, you will see he says the same about quads, and from experience, too, which is always worth reading. One day's experience is worth a month's fancy. Hoping I am not trespassing on your space.—Yours faithfully,

CLAUDE MAY.

D23

Wanted to Communicate.

Sir,—If "Another Mechanic" will be good enough to write me at 62, Solon New Road, Clapham, London, S.W., it is possible we may be of mutual assistance *re* home-made car, as I am cousidering making one also. Thanking you in anticipation.—Yours faithfully, F. W. ROBINSON.

Fitting Motor to Roadster Bicycle.

Sir,—I note in a recent issue (page 445) that Mr. B. A. Hunt says in his paper, "With a 1½ h.p. motor and machine built on cycle lines . . . . with very careful designing this machine could be got down to 60lbs., and be perfectly safe." I should like to give my views of the matter. The beginning of last summer I invested in a secondhand Centaur (Modele de Luxe). It had been kept in very good condition. I was always keen on having a motor, and was certain the machine could be fitted with one, although I was told by people well connected in the motor trade that it would not be safe. So at last I hit on a motor set that I thought suitable. The machine was returned to me fitted complete, tank at the back of saddle, P.R. accumulator, coil, surface carburetter (specified for by myself), etc. Now, the engine is rated 1½ h.p., but I am positive it is more. The machine loaded with oil and petrol weighs exactly 65lbs. I am 6ft. 1½in., and weigh 12½ stone, so I am no light weight. This machine has now been in use for over four months, wet and fine, on rough country roads, and the only trouble I had was with the belt. I have since invested in a good one, and now that is all right. It is excellent at hill climbing, and the control in traffic is perfect, as I fitted a Bowden exhaust valve lifter at an expense of 7s., and no machine is safe in traffic without it, as your hands need not leave the handlebars. Now, sir, where is the secret of the strength? I consider it lies in the section of the Centaur front forks, which are like a figure 8, and this machine well bears out Mr. Hunt's statement *re* touring machines, not only that if anything goes radically wrong with the motor beyond redemption you have only 65lbs. to pedal, not 110 to 120 lbs. If any of your readers would desire to communicate with me, I should be pleased to give them all the necessary information that lies in my power.—Yours faithfully,

H. DAVIES.

120, Clovelly Road,
Newtown.
Southampton

Sir,—Replying to H. Havelock Clark, as to motors fitted to ordinary roadster machines, there are a number of machines so fitted in this town. Being an enthusiastic motor cyclist, I have taken the opportunity of examining one which was ridden alongside me on my "Phœnix" (1902), and I found nothing wanting, excepting, perhaps, absence of vibration was not so conspicuous as in my case, owing to the tyres being only 1½in. The front forks had been strengthened by additional tubes run from the wheel spindle to the handlebar lug. The machine was converted by a man here who is making a speciality of this work, and who charges, I believe, £15 for the whole work of converting the ordinary machine into a really reliable motor-bike. I forget the name, but if Mr. Clark cares to drop me a post-card with his address, I could obtain the name and address of the man for him, as I am always pleased to help a brother "motist" if possible. It may interest your readers to know that I have ridden a "Phœnix" since April, 1902, without a single breakdown of any sort, and the engine on examination shows no perceptible signs of wear.—Yours faithfully, G. ROBINSON.

5, Green Lane,
Trimmingham,
Halifax.

Sir,—I have taken your paper for a considerable time now, and having received much valuable information through its columns, I shall be very pleased if I can be of any help to others. I have a bicycle which has been fitted up with a motor, and I am sending photo, which I hope the Editor can reproduce. The whole set was made by Mr. Greenwood Tiddal, Halifax, including celluloid accumulator, coil, spray carburetter. The motor is made from his own patterns, and I think the bore is 2½in. by 2¾in. stroke. Whatever the horse-power is I don't know, but I do know that it is amply powerful enough for

Illustrating Letter from R. Speak, Halifax.

me, as I can take most hills about here without pedalling, except the very steepest. The only alteration to frame is two extra tubes to strengthen front forks, as seen on the photo. There is one thing I like about this machine. You will notice it has two levers; the nearest the handlebar works ignition and lifts exhaust, the other the spray carburetter. The exhaust is lifted by bringing the lever to the slowest point, so when you start it is impossible to start with ignition advanced. The left handle controls the current. The only trouble I have is the belt slipping occasionally. I expect the hill work about here has something to do with it. Since the photo was taken I have fitted a Lycett motor saddle, with great improvement in comfort. The petrol capacity is about a hundred miles. The accumulator and coil are fitted inside tank. If this will be of any help to H. Havelock Clark I shall be very pleased, as I am perfectly satisfied with motor on ordinary bicycle. The price for the whole lot fitted up complete was £15.—Yours faithfully, R. SPEAK.

Halifax.

Charging Accumulators for Primary Batteries.

Sir,—I am sure that many of your readers (particularly those residing some distance from a charging station) would be pleased to hear the experiences of riders who have used a Fuller or similar primary battery for charging accumulators, with particulars as to cost of chemicals required for a charge, life of cells, and, if possible, how such a battery could be made.—Yours faithfully,

"AUTOTRAC."

Free-wheel Clutches on Motor-Bicycles.

Sir,—In reply to Mr. F. W. Goodwin re free-wheel clutches, I may say I also bought a [illegible] h.p. Excelsior last August, and ride it every day, but whenever the roads are dirty I have difficulty with my free-wheel. I am afraid the only thing to do is to have a gear-case put on. I should like to add that I have never had any difficulty in starting; in fact, I think the motor goes even better in frosty weather, which seems contrary to the experiences of some correspondents.—Yours faithfully, "DOCTOR."

Spark Length or Intensity?

Sir,—On the 26th ultimo we wrote you respecting an article which appeared in your paper under heading "Improving the Coil." We have a big volume of correspondence to get through, and were compelled at the time to cut our letter brief, as mentioned in the letter. The condenser in our coils has received very careful consideration, and it is necessary that this should be made in proportion to the inductor. It is possible to increase the spark by having a condenser too small for the inductor; but then, at the point of rupture of the trembler (whether magnetic or mechanical), there takes place a strong spark from the extra current which destroys the molicules of the platinum very rapidly. Our experiments have been in trying to reduce this detrimental spark at the point of rupture, and, on the contrary, instead of aiming at getting a large spark, we have tried to get a short but very hot spark, which ensures a very good explosion. The length of spark is no advantage. What is to be sought for is the heat of the spark. In point of fact, our new coils, now fitted with fast vibrator, give a very much shorter spark than the coils supplied during season 1902. The sparks are shorter, but they are more numerous and hotter. The G.O.M. coils, without vibrator, as supplied last year, we continue to supply, also coils with the ordinary vibrator, both of which coils give a longer spark than the new fast vibrating coil. To put it briefly, we are making the spark more intense. It of course would be more positive than a long spark in which there is no fire.—Yours faithfully,

HUBERT A. MEREDITH,
Managing Director.
John Child Meredith, Limited.

[We think the statement made in the above, that the length of spark is not the main point in sure ignition, is open to some criticism. The higher the voltage of the coil, and consequently the longer spark, the more certain will spark break through high compression. Heating effect is an important point, but not everything. What do our readers think? —ED.]

Motorcycles and Fire Insurance Companies.

Sir,—Looking through the back numbers of your paper, I have seen a few remarks concerning the action of storing petrol on existing fire insurance policies. On page 366, Vol. I., the "Alliance" Insurance Company was said to allow the storage of a motor-bicycle with petrol in its tank, but later it is stated that almost universally the insurance companies are fighting shy of the motor. Now, it seems to me a very serious condition of affairs if, on the technical point that we have a pint of petrol in the house, a fire company can refuse to pay up if a fire arises from any cause apart from this. For example, under my lease, the landlord insures house, I contents; but I am bound not to allow anything to exist on the place which prevents insurance at the lowest rate, that is, 1s. 6d. It seems to me that this is a subject worth carrying through in your columns to the point of knowing exactly how we insurers stand. Trusting that you will find the space for this.—Yours faithfully, J. HORACE REEVES.

Prefers Surface Carburetter.

Sir,—For nine months I have used a Minerva in my practice, and, except for trouble with the twisted hide belt, have found it to answer admirably. Wishing to be abreast of the times, I have now exchanged the machine for the 1903 pattern, with spray carburetter, and fitted with a Lincona belt. My belt troubles seem now to be at an end, but I fear my carburetter troubles are only beginning. I find that the exertion needed to start the engine is very considerably greater than with the surface carburetter. Now, for a tourist, or one who "motes" for pleasure, and never does less than about a ten-mile stretch without dismounting, this does not matter. But a country medico, who may have to stop five times in half a mile, would, in my opinion, do much better with the surface carburetter, even if it does make his machine look unfashionable.—Yours faithfully, H.R.B., M.D.

Price and Durability of Light Cars.

Sir,—For some time past I have taken in your instructive periodical, henceforth known as "THE MOTOR," and in regard to the engines I have come to the conclusion they are made to run at a speed which sacrifices durability. I have always wondered that the engine is not made to develop its full power at a speed of about 800 r.p.m. I am aware this would entail increased cylinder area, and possibly the superfluous weight of the present motor machines might be utilised to advantage in increasing the proportions of the engine. In regard to price I cannot see how a "man of moderate means" can buy a motorcar or bicycle and lose about 40 per cent. in a season of moderate wear, not including repairs and petrol, which are considerable items. In spite of this, it is apparent that the motor industry has in a short space of time made steps in the right direction; but until the question of the price and durability of cars is gone into, I do not think the time will arrive when the "man of moderate means" can buy a car profitably for business purposes. If the makers would give their attention to the above vital points, it would be beneficial in the long run to those who make as to those who use. The motor trade is an exact parallel with the bicycle trade of a few years ago, when these machines were double their present price, and the public are anxiously watching for the firms that will take the lead and turn out a machine on practical business lines, when they will be able to make a reasonable investment, and at that time (I hope not far distant) the motor will become an indispensable factor in business and in pleasure.—Yours faithfully, "DURABLE."

Design for Home-made Car.

Sir,—Noticing the design for home-made car in "THE MOTOR" for January 28th, I might say that I am building one to the same dimensions as "Another Mechanic's." My object of writing is to put him in a better way of fitting it up. I see from sketch that there is only one speed in his transmission, and as everyone with a little experience of motors knows, that is where tricycles and, I might say, bicycles are at fault. Not having a slow speed for hill work results in losing power just where it is most required. It is absolutely necessary to have two speeds with so small an engine to carry two persons. I see he mentions the "E. M.," and if he will look in that paper for October 10th, 1902, he will see letter and sketch for a working man's motor, by "Electric Jew," which originated through a query of mine. Being a regular subscriber to "THE MOTOR," I should like to put the question: if it would be safe to seat two side by side on one like this, with long wheel base and wide centres to front wheels?—Yours faithfully. J.C.

Lincs.

A frequently observed incident of the Show.

The Aster Engine.

Sir,—I was very interested in reading Mr. T. Roberts' letter concerning his motor-bicycle, and in seeing that he had selected the Aster engine among all those to be seen at several Shows. Mr. Roberts has had some experience of other motors, and his testimony is therefore valuable. He says, "The Aster engine is really magnificent, and, with it, I am a stranger to contact and valve troubles, of which I read so much." I can most thoroughly endorse this, as many Aster engines have passed into my possession, and comparing them with other ones—and I know most existing ones—Mr. Roberts' remarks are no exaggeration. My opinion is that the Aster engine is the best in the world. I am in no way interested or connected with the sale of it—I wish I was. Several years ago, after experimenting with it, I sang its praises in the motor papers, but it was hardly known then. Other makes that were in the field first had the monopoly of the market, and people preferred to stick to the old order. What a change now! Aster engines are everywhere. Heaps of makers fit them. Look at the quantity there were at the Paris Exhibition on all those stands! In France, where they are better known, nearly every firm not making their own engines now fit Asters. And what a racing record they have! The "Societe l'Aster" do not advertise much, or attempt to bring themselves before the public; but, nevertheless, they had to double the size of their works the other day in order to cope with the orders in hand. People who once try an Aster generally take to no other make.—Yours faithfully,

LEOPOLD CANNING.

Detail Inventions for Motor.

Sir,—Of the three inventions described and illustrated by Mr. H. C. Andrew in a recent issue, two have been tried by me many months ago, one being adopted on the Phœnix since June, 1902, this being the cap and pipe over air valve nut. This has proved a complete cure of the oil splashing trouble, and is still fitted as a standard to the Phœnix motorcycles. Your "Mr. Cyclomot" made reference to it only in a recent issue, describing it as one of Hooydonk's dodges. The clip for fixing the petrol inlet valve on the type in vogue in 1902 answered well for some time, but the trouble was that it finally forced the bottom out of the inner tank, and it is as a warning to anyone who might adopt the device that I refer to it. The funnel head to air chimney I can only describe as distinctly good, and it should help to vaporise the petrol if it is found that the mixture does not allow of any air being admitted through mixing valve.—Yours faithfully, J. VAN HOOYDONK.

Small Accumulators.

Sir,—In a recent issue Mr. Henry Wood gives some data respecting small accumulators of 3 ampere hour capacity. I have a reliable cell of the same number of ampere hours, by good maker, weight 2lbs. (4 volts), which, to say the least, is somewhat heavy for the pocket; but for sixty miles and over, good riding on one charge, has it conscientiously fired the mixture until having been dropped out of a Minerva case twice when going at full speed. It is now being fitted in a new box, the plates being in good condition, the current being 1.5 amps. at discharge. This comes as a reward for buying a good cell. By small accumulators, I mean those of waistcoat pocket size, sold by opticians, etc., for 5s. or so, one positive, one negative, 1in. by 2½in., approximately. My friends' eighty yards' tour was taken from such a cell. If an accumulator can and will give better results than the above distance, size for size, perhaps some motor cyclists would experiment and report progress, because a small cell would mean sometimes the saving of a mile or two's tramp.—Yours faithfully, LEONARD BELL.

*** *We are making every effort to cope with the inrush of correspondence and have devoted four pages to "Other People's Views" this week. We regret to say a number of letters are held over till next week.*—ED. "THE MOTOR."

Our Information Bureau.

SPECIAL NOTICE.

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

1. Plain writing. Type-writing for preference.

2. All letters to be written on one side of the paper only.

3. Questions to be clear, terse, and to the point, without tedious preamble or needless flattery.

4. If an immediate reply is required, an envelope must be enclosed bearing a penny stamp, and the name and full address of the sender. NOT a stamped undirected envelope.

A.C.F.—The reason for the bottom bracket axle working tight, we should say, was because the cups had not been properly locked. A good enamel for touching up is "Club Black," advertised in "Cycling."

H.A.F. (Nottingham).—(1) The following machines have magneto ignition:—"Clyde," Singer, Davidson, Altena, and Progress. (2) Chain driving machines are:—The Humber, Bowden, Clement-Garrard two speed, King, and Princeps.

G.E.C. (Eastbourne).—We are aware that an ignition system on the lines you refer to has been recently put on the market. But it is too soon to say whether it is going to prove successful for motor-bicycles. Doubtless we shall hear something about it when the season gets going.

A Question of Brakes.

W.W. (Leigh-on-Sea) writes:—As a constant and interested reader of your paper, may I ask you to advise me? I have a "Brown" [illegible] h.p. bicycle, which runs splendidly, but is only fitted with one brake, and that of the B.S.A. front rim pattern. There is not clearance enough between belt and rim for a rear Bowden, and the accumulator box interferes with the fitting of a "Cam" brake. Do you think a "New Departure" hub would be the thing? A local cycle maker to whom I spoke says the New Departure has a habit of running hot on motorcycles. I confess I cannot see why it should, if attention is paid to lubrication, but no doubt you will be able to tell me?—There are plenty of machines doubtless fitted with hub brakes, and possibily on a lengthy incline there would be a tendency to heat somewhat. But with careful handling of the front brake to assist there should be no trouble. Another type of brake that you might be able to have fitted is the Garrard "Model-a...n." In this there are no frictional surfaces inside the hub.

A.M. (Hanley).—Make tank of No. 18 or 20 S.W.G. sheet brass. Either nickel plate it or use aluminium lacquer. Double pole sparking plugs are not made to fit the standard size bore. The E.I.C. have a special one. We do not recommend any alteration of present plug.

"Amateur" (Birmingham).—(1) The two-stroke motor is only used at present to a very limited extent in motorcycle work. The advantages of this type of motor are its simple construction and smoother running than with the four-stroke motor. It is not economical in petrol consumption. The "Princeps" machine has a free engine clutch, and can be started up independently.

Water Cooling or Air Cooling.

C.M. (Richmond) enquires if it would not be an advantage to adopt water cooling on all motor-bicycles over 1½ h.p., and if it is not a fact that the loss in efficiency of small motors when hill climbing is mainly due to overheating?—Experience has proved that air cooling is perfectly satisfactory up to 3 h.p. In fact there are much higher powered machines than this—chiefly racing machines, that run well with air cooling. Any advantage likely to obtain by adopting water cooling on medium powered touring machines would be overbalanced by the additional complications introduced, and the using up of valuable space required for petrol, etc. Overheating on hills is not an inherent defect of well designed small motors. It is more generally the result of unskilful driving. The great point is to take care that the motor is not overloaded on hills or is run with full charges of gas fired early. The speed should be kept up by light pedalling, and the mixture should not be made too rich in gas. It is also most important that the spark be retarded, otherwise there is a great loss in efficiency, owing to the piston having to work against a back pressure and a low velocity.

J.M. (Leeds).—(1) You will find Chater-Lea fittings very suitable. The 2¾ h.p. De Dion motor we should recommend for trailer work. (2) Have a Coventry Eagle trailer. (3) Longuemare spray carburetter. (4) It all depends upon the skill of the assembler whether a built-up machine would run as well as a factory-built one.

Best Gearing for Pedalling.

"Gear" (Derby) enquires what we consider the most suitable gear (for pedals) for a [illegible] h.p. motor-bicycle. The machine will be used in a hilly district.—A rather low gear between, say, 60 and 66 inches, will be found to be the best all round, as considerable help is required at starting the machine, and uphill it is possible to keep the speed up without undue exertion. A high gear could only be used to effect when it is least required, namely, when the motor is running fast.

Oil in Carburetter.

"Alpha" (Wrexham) has noticed that a good deal of oil seems to get down the inlet pipe and into the spray carburetter of his motor-bicycle. He is at a loss to account for it, and wishes us to advise him what to do as a remedy.—This is the result of over lubrication, and probably of too weak an inlet valve spring, which allows the oil that has got into the combustion chamber to get blown through the valve on the compression stroke, owing to the valve not closing properly. The first thing to do would be to use a smaller charge of oil, and the second to grind in the inlet valve and give more tension to its spring.

Difficulty in Starting Voiturette.

"Won't Start" (Oxford) has a well-known voiturette, which has given great satisfaction, and has run thousands of miles without a single breakage, but now and again it is most difficult to get the motor to start. Sometimes the handle requires turning for twenty minutes to get a single explosion, and at other times it will start with half a turn of the starting handle. The spark is perfect, and both porcelain and mica plugs have been tried with the same result. The carburetter is a modern type of spray. What is the reason for this?—A difficulty in starting is rather more likely to occur with a car motor than with a cycle. Providing the ignition is perfect, the failure to start must result from absence of an explosive charge in the cylinder, which means that the air adjustment on carburetter is very sensitive, so that if the engine does not fire the first turn of handle, the carburetter should be flooded and the air adjustment altered till the right mixture is found. Sometimes the difficulty is really due to the trembling make and break not being set perfectly even, although when "sprung" with the finger it may appear to give an excellent spark.

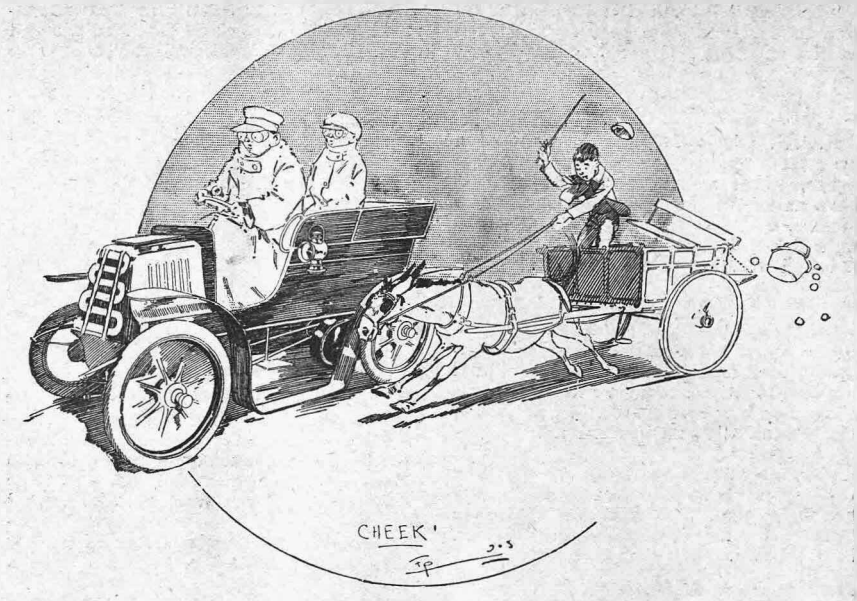
R.B.A. (St. Day).—We should select the New Hudson as being the best of the three machines you submit, and we recommend you to invest in one.

Charging from Electric Light Supply.

A.H. (Cowes) sends the following.—We have just had electric light fitted into our shop, and should like you to enlighten us on several points. We have five 8 c.p. and one 16 c.p. lamps, and the voltage of the supply current is 240 volts. On most of our accumulators it requires one to two amperes to charge. Can we arrange the accumulator so that we can charge it and get the advantage from all the lights? What we propose to do is to charge our accumulator when the lights are going in the shop, so that we can do them at no extra cost. Would it be correct to connect up to the wires immediately after they leave the meter, and switch in the lights till we get, say, 1½ amperes? Or should we have to get about a 100 c.p. lamp with adapter, and put it in one of the holders? Would one lamp 16 c.p. or 32 c.p. charge an accumulator up at all?—You can charge the cells perfectly from the supply. Simply take the cover off a switch that controls the five 8 c.p. lamps, have the handle off, and join a yard or so of insulated wire to each of the contacts in switch, find out which is the positive wire, and then couple up to your accumulator. Do not put the switch on, as the accumulator does the same practically, and you get the light and charge up at same time. Full particulars given in "Motor Manual."

Faulty Connections.

G.H.M. (Rugby) writes:—I have had a motorcycle recently built for me, which I cannot get to go satisfactorily. It has a 2¼ h.p. De Dion engine, Longuemare carburetter, and Peto and Radford's accumulator and coil. The compression is good, the spark also seems good, and I have kept the motor well lubricated, so that I do not think that the motor heats, but I have great difficulty in getting it to start; in fact, often without avail. The few times I have got it to go it has taken me a mile or two from home, when unluckily I have stopped, and then could not get another explosion, so that I have had to wheel the machine home. The accumulator has been well charged. I thought once it was the inlet valve which was wrong, as when I took it out it seemed as if it was stuck with lubricating oil, but I washed the cylinder well out with paraffin, and then put in three charges of lubricant, and started it off on the stand, after which I took it out. Motor started off fine, but, finding my belt slack, I got off to tighten it, and, on getting on again, I could not get motor to go at all. I had only gone about 200 yards. Will you kindly say if we have wired motor up properly, as I could not tell by your illustration in "Motor Cycling," as there is only one wire to contact breaker, whereas I have two.—There is certainly a mistake in your connections. You appear to have made just the mistake several other correspondents have made, and put the contact screw to the frame. This must be disconnected, and a wire taken to the handle-bar switch, and no part of the primary put to the frame, otherwise you will get sparking from trembler blade to cam. This throws the trembler contact out of action. The amount of lubricating oil used was far too much, and causes the inlet valve to stick and sooting of plug.



H.P.J. (Stamford Hill).—(1) The type of contact you refer to is a simple make and break. (2) The condenser is connected between positive terminal and frame, so that it really is joined across the contact breaker. (3) You will find that you get a better spark coupled up with a particular end of primary coil to + of accumulator. (4) All spray carburetters must be fitted below tank level to get the necessary flow. (5) If petrol floods out from spray jet either float valve leaks or supply tap is too full on.

Spray Carburetter Difficulty.

W.A.A. (Bath) writes:—I possess a Coventry Humber 2¾ h.p. motor-bike. It is fitted with a spray carburetter. In the recent cold weather my engine would not work for any length of time outdoors, though it ran all right on stand for a few seconds.

I sent the carburetter to Coventry to be tested, and they returned it to me as perfect, after they had put a small plate with five small holes in it over the air inlet at back of the spray chamber. But my motor now won't go for any length of time. It gradually slows down, and I have to cut off the air supply to quicken it up, but eventually it stops altogether, no matter what mixture I give it. This carburetter has no hot air feed, and Humber's say it does not want it. I believe it does. The accumulator is well over 4 volts, and I get a good spark, so I am sure the ignition is perfect. Can you advise me? At starting I have to shut off the air. Is this as it should be? — We should say there is some defect with the float, or an obstruction in the spray. The fact of having to shut down the air supply shows that the petrol supply at the jet gradually fails. It would be as well to first see that all the passages to float chamber are clear, and then see that the petrol comes through the jet when the float is pressed down. This being assured, it is simply a question of striking the correct mixture. What we suggest is to have the main air inlet on the top of spray chamber shut right off, and only have the air entering at the lower part, as we presume this is where the perforated plate has been placed. Once this is set so as to give a mixture for starting, i.e., when the suction is only slight, as the speed rises more air can be admitted from the top inlet. The fact that you have to shut this inlet at starting bears this out. It can only be a question of mixture if the petrol supply to the jet is assured.

Carburetter Query.

X.Y.Z. (Finchley).—There are two chief types of spray carburetter. The first is the float feed, in which a constant level of petrol is maintained in the spray tube through the agency of a float operated supply valve; numerous makes work on this principle. The Longuemare, Werner, and F.N. are well-known examples. The other type of spray carburetter has a suction-opened supply valve, consisting of a disc which lifts up with the suction of motor and opens a needle valve controlling the petrol supply to the spray jet. The valve shuts automatically by a spring. A good representative of this type is the "Roubeau."

Dynamo for Ignition and Light.

"Mobike" (Stockton) sees no reason why a small dynamo should not be run off the back wheel of a motor-bicycle to always keep the accumulator charged, and also supply an electric light automatically, and thus solve the difficulty as to a suitable light, as neither oil nor acetylene can, he thinks, be considered ideal. He asks us what we think of the idea, and the reason why something on these lines has not been adopted?—We agree with "Mobike" that this idea is perfectly workable where you have the power to spare, and when a little extra complication is of small moment. In fact, certain builders of motorcars adopt the plan most successfully. Small dynamos take far more power to drive them than is generally supposed when it is desired to get a usable amount of electricity out of them. An efficiency of 25 per cent. would be extra good for one of such a size to be suitable for a motor-bicycle, and on many machines there is very little power to spare. To supply a good light, as well as work the coil, a good size accumulator would be required, and the dynamo would have to be provided with a governor to keep the voltage steady. But makers are disinclined to introduce more complication.

"Enquiry" (South Shields).—We recommend you to state your requirements to Brown Bros., Great Eastern Street, London. We have no doubt but that they can supply you with a 3½ h.p. motor set complete.

R.O.U. (Fallowfield) is in want of a good small-power motor set at a low figure. Can we recommend one?—We have examined the "Brutus" set sold by Messrs. C. Peacock and Co., 35, Clerkenwell Road, London, E.C., and consider it excellent value at the price asked.

Power of Motor.

G.L. (Preston) asks:—(1) What horse-power does the Clement-Garrard chain-driven motorcycle develop? (2) Would it be safe to attach tandem attachment, as advertised in "THE MOTOR" by Riley and Co. to the Clement-Garrard motor-bike? (3) Do you advise 1¾ or 2 inch tyres if the above attachment is used?—(1) The C.-G. motor standard size is about 1½ h.p. maximum. The firm also make a 2 h.p. (2) If frame is strongly built it would be quite safe. (3) Have 2in. tyres.

An Ignition Difficulty.

P. P. writes:—"Would you be so good as to let me have a sketch of the correct wiring of a De Dion tricycle, with five terminals on the coil, handle switch, but no interrupter plug? Also, which terminal on the coil goes to earth? What is the maximum speed of a 2¾ h.p. De Dion engine? Is 13 teeth to 96 a proper ratio of gearing? Riding my tricycle on a recent occasion I had to stop for traffic, and it absolutely refused to start again. I found accumulator only gave three volts; spare one gave the same. Joined them up in series, got over five volts at contact breaker. The motor sparks splendidly with exhaust valve lifted—I have one of the new sparking-plug attachments, which break the circuit between coil and plug—but when you drop the valve spark stops instanter. Tested voltage several times, always over five. High tension wire is a new one, and does not touch exhaust pipe. I may mention that I am not a novice, this being my sixth machine. I have tried all the ordinary remedies, such as new plug, cleaning contacts everywhere, etc. Should be very glad if you can explain the above, as I am still in difficulties.—To give the connections for a coil with five terminals which are not marked would be difficult to do with accuracy without making a test to trace them. The frame connection terminal, erroneously termed "earth," is, as a rule, marked "E" or "M," and joins one end of secondary. In a five-terminal coil the makers take one of the condenser connections to a terminal which also goes to the frame, the object being that one set of the condenser plates will always be at zero electrical pressure. We should say that it would be best to leave the connections as at present arranged if a good spark is obtained from high tension wire to frame. It would appear that the sole cause of "P.P." not being able to start his motor was that both sets of accumulators had run down. The two sets in series might show five volts on open circuit, and have current enough to give a weak spark on no compression, and, of course, as soon as the valve is closed, the compression squelches the spark out. The accumulators should be carefully examined for short circuit. Maximum speed of motor about 1,800 revolutions. The 1 to 7 gearing is right for average work.

H.S. (Heywood).—(1) We can recommend one of Peto and Radford's small cells. (2) You could probably charge in about ten hours if you take the current from a two-light switch. (3) The volts immediately after charging are 2·4 per cell, but in a short time it becomes normal at 2·2.

"Belt" (Croydon).—We should say that the continual pulling through of the hook is due to running with too tight a belt. The holes for the hook also require to be carefully made right through two thicknesses of leather, and not too near the end. It is possible to run several hundred miles without a breakage.

Wiring of Motor.

C. D. Freeman.—We think you will be able to put your wiring right by referring to the diagrams that have been given recently. The terminal on your coil marked M must go to the frame, and P to the positive pole of accumulator. The other terminal goes to insulated screw of contact breaker, and the negative of battery to plug and handlebar, and then take a wire back to P.M.

Efficiency of Contact Devices.

X.Y.Z. (Gloucester).—(1) The question as to whether a high speed trembling coil is a great improvement on the simple make and break, and thereby gives more power from the motor, is one upon which there is much diversity of opinion. We should say a trembler coil and brush contact would be better than a De Dion trembling make and break. (2) You certainly should have several thicknesses of gauze in the gas supply pipe, otherwise the risk of a fire-back and explosion is great.

Explanation sof Terms, etc.

"Jock" (Glasgow) asks us to explain the meaning of high tension, low tension, coils, tremblers, accumulators, and also how a car is wired, as previously his experience has been with tube ignition.—We might remind "Jock" that explanations on these points have been given many times, and it is hardly necessary to repeat them, especially as all these matters have been made a special feature in the "Motor Manual," a copy of which our correspondent should get, as he will be able to learn a lot from its pages.

ANSWERS BY POST.

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

Friday 6th.—R. B. Adams (Glasgow), W. C. Goodman (London, S.W.), J. W. Rushby (Wainfleet), D. Webster (Sutton Bridge), A. H. Aloof (Brixton), J. McK. (Glasgow), W. H. Dengate (Northiam), J. L. Allen (London, S.E.), F. R. Irving (Gloucester), E. A. Bartlett (Leamington), T. Allis (Stockwell), D. Jones (Balham), G. H. Gunston (Bath), J. Makepeace (Hexham), J. Paterson (Glasgow), G. E. Henigan (Balham).

Saturday 7th.—H. S. Thrower (London, N.W.), S. R. Thompson (Maidenhead), F. Wood (Wheatley), R. J. Gibbs (Portsmouth), P. E. Dowson (Hyde), G. E. Tennant (Leeds), C. Lyall (Grantham), T. G. Cochrane (Oxford), L. C. Ducrocy (Wokingham), J. Turton (Goole), R. W. Mitchell (Wandsworth), J. McIntyre (Birmingham), A. J. Palmer (Windermere), Dyson Bros. (Peterborough), S. H. Miles (Burslem), W. Hope (Sheffield), T. A. Hitchcock (Crayford), H. Wallace (Belfast), V. Nightingale (Deptford).

Monday 9th.—E. Joshua (Melbourne), V. C. Clarkson (Leicester), B. Fortune (Harrogate), E. B. Gornall (Clitheroe), A. Wilson (Wandsworth), H. C. McKenzie (Rochdale), J. H. Slee (Newcastle), W. P. Green (Southampton), C. B. Ancell (London), W. Lloyd (London), A. T. Heelas (Wokingham), R. B. Cafferata (Orston, Notts), A. Lambert (Hayward's Heath), H. V. Donaldson (London), E. Holman (Waldron, Sussex), R. V. Stick (Northampton), A. Hunt (Chesham), B. L. Playfoot (Lamberhurst), L. H. Goodman (Bromley), H. Lidstone (West Hampstead), E. A. Mercer (London).

Tuesday 10th.—B. G. Asker (Forest Hill), J. E. Cohen (Hampstead), P. Dewar (Lochwinnoch), J. Tinniswood (Workingham), J. C. Hunter (Huddersfield), C. E. Beresford (Derby), W. Vaisey (Nottingham), R. Radcliffe (Liverpool), V. Burrows (Morpeth), H. Ansell (Barrhead), F. L. Keith (Aberdeen), H. Bourne (Bexhill), J. L. Dixon (London, N.W.), J. S. Mason (London), S. H. Miles (Colridge), C. J. Baker (London), G. E. Henigan (Balham).

Wednesday 11th.—James Latham, Jun. (Walthamstow), W. Denny (Esher), E. Holman (Waldron), R. Wilshire (Eastbourne), F. Farman (Romsey), E. L. Johnson (London), F. B. Oakes (Loughborough), S. E. Bee (London, S.W.), C. Wade (Hull), W. Cobbett (Hants), F. D. Nawell (Manchester), A. E. Tiller (Southampton), C. Wright (West Kensington), E. S. Mitton (Birmingham), H. S. Monks (Nottingham).

Thursday 12th.—R. H. Gardiner (Woolwich), H. L. Gipps (Canterbury), R. Jarvis (Barrow), E. S. Brahman (Gloucester), C. S. Mossop (New Romney), S. S. Godkin (Wexford), A. Cunningham (Heckington), A. Davies (Tooting), T. L. Heaps (Nottingham), L. Holman (Blackpool), S. Beadle (Blackheath), J. H. Fitzgerald (Chiswick), R. Wilson (Wrexham), H. Mumford (London, S.E.), R. Edwards (London, N.), A. Collis, (Putney, S.W.), J. J. Lewis (Silloth), T. Holroyd (Stokesley), P. C. Pearson (Southsea), A. C. Adamson (Highgate).

*** *We are sorry to have to inform readers that we cannot possibly reply to queries by telephone. A staff of experts are constantly replying to letters by post and through the paper, and it is unfair to delay replies to those who are conforming to such regulations as we have laid down, by detaching any member of the staff to reply to those privileged to use the telephone. We feel sure our readers will realise that our decision in this matter is prompted by a desire to be fair all round; and that there is no intention on our part to be discourteous or disobliging.*—EDITOR.