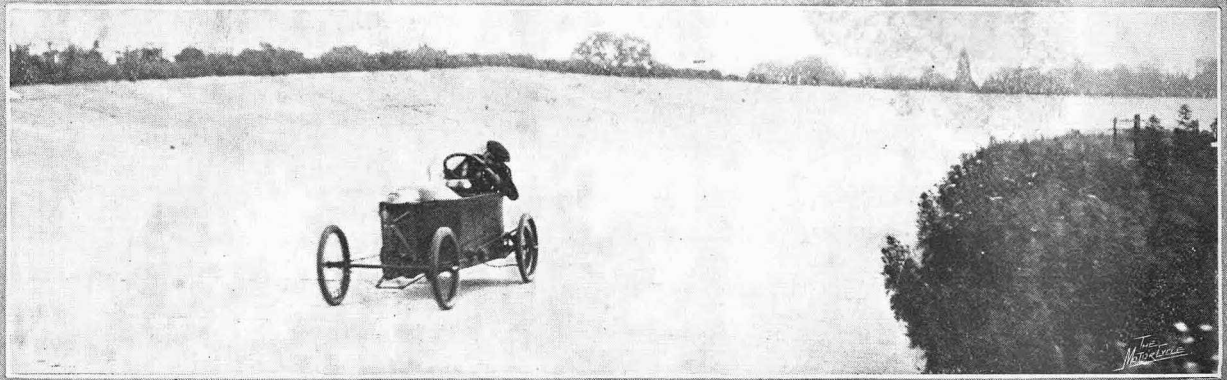


The **Cyclecar**



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THE ORIGINAL CYCLECAR.



THE BEDELIA HAS BROKEN THE HOURLY CYCLECAR RECORD THREE TIMES THIS YEAR, AND ALSO HOLDS THE 2-HOUR AND 100-MILE RECORDS.

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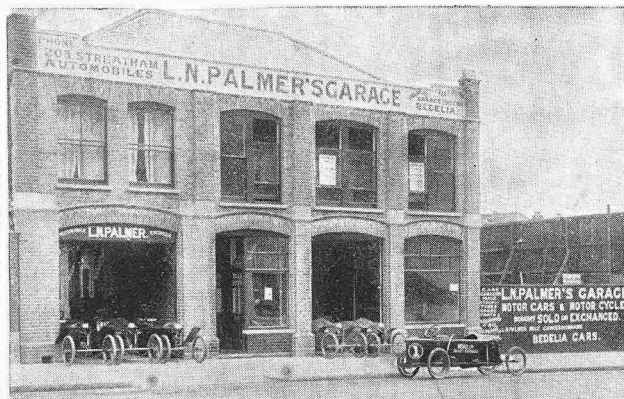
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The Cyclecar



RAPID BUT SOUND PROGRESS!

THE first number of THE CYCLECAR should indicate the possibilities of what has been aptly termed "the new motoring." It should be borne in mind, however, that the industry is still in its infancy, and where reliability is required immediate deliveries of all makes cannot be obtained.

All interested in the cyclecar will agree that it is imperative that the new industry which is arising should be built up on sound commercial lines. There is an exceptional opportunity for capitalists and manufacturers who will act quickly before strong competition is set up by a deluge of machines from abroad. At the same time we do not wish the industry to suffer from a so-called "boom," with its inevitable consequences.

It needs men with a grasp of its possibilities, familiar with the requirements of the tens of thousands to whom the cyclecar will appeal, and it is vitally important that those requirements should be carefully studied. A fundamental error would be development on too-expensive lines, for while there may be a big future for what is practically a light car, it should be apparent that the demand will always be greater for something lower in the scale—simpler, smaller, and more economical to run. Great emphasis is laid upon this point in an important article by Mr. Chiozza Money, M.P., appearing on pages 11 and 12.

Some of the excellent machines now before the public are produced by manufacturers with limited means. There are always people willing to invest in a sound scheme, and it is our hope that these parties will be brought together. We proffer our services with a desire that immediate and rapid progress will be made, and that the industry will prove itself to be as invulnerable against foreign attack as has been the case with the British motorcycle and, before that, the pedal-cycle; nevertheless, the foreigner can always be sure of fair treatment at our hands. But great as is our concern for the industry, it must be still greater for the public to whom we now make our bow.

EDMUND DANGERFIELD
AND STAFF OF "THE CYCLECAR."

THE CYCLECAR WORLD.

Notes, News and Gossip of The New Motoring.

Number one.

The topic of the past six weeks.

Over 80,000 copies are now on sale.

The first issue includes 85 pages of advertisements.

Sketches by artists exclusively retained by THE CYCLECAR will be a great feature of future issues.

THE CYCLECAR is registered at the G.P.O. as a newspaper, so the postage of a copy if sent to a friend is one halfpenny.

Apart from technical freehand drawings, the pictorial work of six artists, all of whom have made a study of the cyclecar, appears in this issue.

The Sutton Coldfield and Mid-Warwickshire A.C. have decided to hold a reliability trial of cyclecars on 21st December, and the course will be Banbury and back, including Rose, Sunrising and Edge hills.

Advertising the New Motoring

To demonstrate the new motoring to the public, a procession of cyclecars of widely-varying types through the principal streets of London was arranged to take place on Monday, the opening day of the Olympia Show. No doubt many readers will observe this interesting procession, and as the names of the various machines are painted on them, it will familiarize the public with the appearance of the various makes. The procession was organized by THE CYCLECAR.

A Movement Worthy of a Journal of its Own.

We have received orders for over 80,000 copies of No. 1. of THE CYCLECAR, a quantity which will probably be exceeded. The advertisement pages of this first issue total 85. There are some 35 cyclecars exhibited at Olympia, which are dealt with comprehensively in this issue, which includes 52 pages of reading matter. It is an issue, too, which should indicate in many ways the vast possibilities of the new movement.

A New Definition.

At the Cycle and Motor Cycle Manufacturers and Traders Union dinner on Friday night, Mr. C. Vernon Pugh, in response to the toast of the Show, set out a new definition of a cyclecar. It was to this effect: The cyclecar is a vehicle of three or four wheels, every detail of which shall be in harmony with motorcycle practice and as easily handled as the motor-bicycle, a definition he advocated adopting. He considered the future sale of cyclecars to be beyond computation. There were many other references to the cyclecar during the evening. Mr. E. Manville, president of the Society of Motor Manufacturers and Traders, who proposed the toast of the Union, mentioned that a few years ago there was a sharp dividing line between the motorcycle and the motorcar trades. He now thought they overlapped, and by the efforts of Mr. S. Bettman, of the Triumph Cycle Co., the Cycle and Motor Cycle Manufacturers and Traders Union, in whose jurisdiction the cyclecar comes, had now attained adequate representation on the Council of the Society of Motor Manufacturers and Traders.

A sensation of the Show—

A four-wheeled monocar for 70 guineas.

Another sensation—the first issue of THE CYCLECAR.

Another—a four-wheeled, three-speed two-seater for 80 guineas

And still another—the first published report of the motorcycle exhibits, complete, in "Motor Cycling," out on the opening day!

"Motor Cycling" Show Report Number is illustrated from upwards of 400 special photographs and drawings, a feature in which it undoubtedly leads.

A 10,000-mile test of a water-cooled engine forms the text of a very interesting article which appears in "Motor Cycling" this week.

Motoring is making enormous progress in America, "The Motor" points out this week in an interesting article on the amazing growth of the motor industry in that country.

A PREDICTION.

Despite a contrary opinion very generally expressed by motor manufacturers and others, we predict that, in the not very distant future, there will be an immense demand for the four-wheeled single-seater.

The Hour Record.

Last Tuesday, Mr. J. T. Wood put up a new cyclecar hour record for the "Motor Cycling" trophy by covering over 56 miles on his G.W.K. When the news was heard at Malvern, Mr. H. F. S. Morgan made immediate preparations to regain the record on the Morgan runabout. On Saturday afternoon last Mr. Morgan succeeded in putting up the figures to 59 miles 1120 yds.—a speed that demonstrates what can be accomplished by a cyclecar. We expect that 60 miles will be covered in the hour before the week is over. Who will do it?

A Brooklands Challenge Trophy.

Keen competition has been witnessed this year for the honour of holding the handsome silver trophy put up by "Motor Cycling" for the hour cyclecar track record. The driver who puts up the longest distance by the end of 1912 will hold the trophy for a year. Monthly gold medals are also awarded for the best performances.

Demonstrating the Cyclecar.

Cyclecar meets and "rallies," reliability trials, hill-climbs, and competitions generally, will greatly help the new movement. We suggest that the Cyclecar Club should take this matter in hand at an early date. It would be an excellent idea to hold a great cyclecar rally, say, at Taunton. The long run and the Devonshire hills would certainly bring out both good and bad features of design, but apart from this the collection of machines parked at the destination would be instructive to the public.

100 Miles an Hour.

A light monocar, fitted with a 16-20 h.p. aeroplane four-cylinder J.A.P. engine, is now being constructed. On this powerful machine Mr. Harry Martin intends shortly to attempt the speed of 100 miles per hour at Brooklands track. In order to make the machine hold the track at high speed, great attention is being paid to bring the centre of gravity as low as possible. Should he succeed, this should tempt the Bedelia people to bring over "No. 75," the huge racing model which competed at the recent Gaillon hill-climb.



THE NEW MOTORING

"Now, if only this thing had wheels, I might practise getting through the front gate."

Petrol—is. 7d. a gallon! And likely to go up higher.

The economy of fuel in the light running cyclocar gives it a big advantage over the car when the price of petrol is high.

There is room for a British home-produced fuel in competition with foreign spirit. "The Motor" has found a fuel of 25 per cent. higher efficiency.

"Gentlemen, The New Motoring."

A cyclocarist, well-known to the cognoscenti at Brooklands, had stopped to clean a plug on the rakish-looking racing Morgan. Its stream-line body at once attracted a huge crowd. "What is this thing?" asked first one and then another. "Is it a racer?" "What speed does it do?" "Where's the passenger sit?" and so on. Waving the crowd on one side, having started up the engine, the driver turned round to the assembly, and striking an attitude, exclaimed: "Gentlemen, the new motoring!"

The last impression was of an awe-struck collection of loafers still working it out.

Oscillating Wheels.

In a letter appearing in our columns this week, a correspondent suggests that oscillating wheels might be employed which would lean in when taking a corner, thus getting an effect very similar to a motorcyclist who takes a sharp angle by leaning his machine in and the weight of his body out. This immediately recalled the old "Swift Swing Frame" tri-cycle, and we communicated with Mr. F. B. Bale, London manager of the Swift Cycle Co., Ltd., who informs us that it was designed by Mr. A. C. Kingston Welch, inventor of the Dunlop-Welch tyre. Mr. Bale adds that the frame was made to oscillate, so that in turning a corner the rider leant inwards, and it was thus possible to take a curve at a high rate of speed. The tri-cycle was very much narrower than the standard make.

The Dursley-Pedersen cyclocar will be described shortly. It has a four-cylinder air-cooled engine.

A new cyclocar is now being constructed with chassis and body consisting entirely of stays and wires.

The makers of the Automobilette base the running costs of their machine, including wiping out the capital cost on a three years basis, and averaging 10,000 miles on tyres, at 0.8d. per mile.

A Standard Cyclocar Road Race.

A suggestion was recently put forward in the pages of "Motor Cycling" which will have the heartiest support of THE CYCLOCAR, viz., that a standard cyclocar road race in the Isle of Man should be held in 1913 or 1914. What the Tourist Trophy Race has done for the motor-bicycle—and the British motorcycle industry has been placed in a position which is pre-eminent—the standard cyclocar race will do for the cyclocar. A severe test at speed with standard machines only—not freak cyclocars built specially for speed—will develop and prove reliability like no other form of competition. We have received the opinions of practically all the leading cyclocar makers, and needless to say the majority are strongly in favour of the race. In an early issue we shall deal very fully with the proposed scheme. It should be added that the proposed standard cyclocar race has nothing in common with the contemplated race for light cars in the Isle of Man organized by the Royal Automobile Club. Obviously, it would be farcical for the simple little cyclocar to be competing against much more powerful cars, although if such a race took place we should not be surprised to see the cyclocar put up the fastest time of the day. What would the entrants of "light" cars say to that? Where the cyclocar loses in weight it gains enormously in speed—witness the Rudge cyclocar which, with a 750 cc. engine, has actually attained a speed of 55 miles an hour on the road.

THE CYCLECAR WORLD (contd.).

Widespread Interest.

Although the cyclecar industry is in its infancy, the interest taken in the movement is really extraordinary. Since the announcement of the publication of the new journal, hundreds of letters have been received and replied to, most inquirers asking for information on selection of a suitable cyclecar.



**QUITE
FEASIBLE.**

Some types of cyclecars, notably the tandem type, can be driven through many front gates, especially those of country houses, and of houses built on "Garden City" principles.

Cyclecar Company with Capital of £60,000.

With a capital of £60,000 devoted entirely to its production, the Perry cyclecar has now been launched on the market. Great secrecy has been maintained as to the lines of this new model, which follow car practice more than motorcycle. An illustrated description of this entirely new production appears on another page of this issue.

CS

THE NEW
CYCLECAR
CLUB. : :Inaugural Meeting at
the Olympia Show
on Friday Next.

Cyclecarring is going to be such a big thing in the immediate future that it demands its own club, which shall be looked upon as the leading club. A preliminary meeting has already been held at the Holborn Restaurant, at which the new body was formally launched, and since that date a working committee and officers have been appointed.

On Friday next, at Olympia, in a special room provided by the courtesy of the Cycle and Motor Cycle Manufacturers and Traders Union, a meeting will be held of all those interested in the formation of the new club, at which the rules drawn up by the provisional committee will be submitted for approval and applications for membership received.

The club is being formed to encourage the new motoring, and, subject to the approval of the general meeting, will be open to both ladies and gentlemen qualified to hold a motorcar driving licence. This does not mean that intending members will have to obtain a licence first, but it is put forward as a suggested definition of suitability for membership. It is not proposed that only cyclecarists shall be admitted to membership, as there would then arise the debatable question of "What is a cyclecar?" One of the provisions of a preliminary meeting was the decision to restrict the trade element on the committee, and this has been adopted, and a rule covering it will be suggested on Friday.

It is proposed that the subscription shall be £1 1s. per annum, and for ladies and country members 10s. 6d. Entrance fee 5s.

The officers of the club are as follow: Hon. secs., Mr. Frank Thomas, 172, Belsize Road, London, N.W. (Phone, Gerard 3781), and Mr. Osmond Hill, 19, Elsworthy Road, London, N.W. (Phone, Mayfair 1248); captain, Mr. W. G. McMinnies, 7, Rosebery Avenue, London, E.C. (Phone, Holborn 5292); hon. treasurer, Mr. A. C. Armstrong, "Meadows," Hook, Surrey (Phone, Kingston 1431).

Organized meets will be a strong feature of the new club, and it is proposed to have a big outing on the Sunday after the close of the Show. It is hoped that all cyclecarists will make an effort to attend. Those interested should get in touch with any of the above gentlemen.

Cyclecar Taxation.

A Royal Commission appointed to inquire into a revision of the taxation of motorcars and motorbicycles has reported. Its recommendations, so far as they affect cyclecars, are most unsatisfactory, for it is proposed to tax a little 8 h.p. cyclecar on the same basis as a 11.9 h.p. car, the one weighing under 7 cwt. complete and the other about a ton! However, it has been explained that no revision of the taxes is possible without fresh legislation, which, with the present congested state of Parliamentary work, is about as indefinite as the Greek calends. At present three-wheelers pay the motorcycle tax of £1, and a cyclecar, not exceeding 6.2 h.p. R.A.C. rating, £2 2s. It will be seen that a four-wheel machine is classed as a car.

MUCH CHEAPER — A Rival to Petrol with FUEL, 25% Greater Efficiency.

Although the cyclecar has a great advantage over the car in its much lower consumption of petrol, 50 miles to the gallon being easily maintained, everyone interested in the cyclecar movement will see the importance of bringing about a speedy reduction in the price of fuel. A new spirit has been found and its efficiency tested by "The Motor." The tests revealed the astonishing fact that the new spirit has 25 per cent. greater efficiency than petrol—that is, if 48 miles to the gallon can be obtained with petrol, 60 miles could be obtained with the new fuel. It is produced from coal dust, and is a form of highly-purified benzol. It must not be confused with ordinary 90 per cent. benzol, however. In "The Motor" this week will be found a very striking article dealing with "National Fuel Economy" and pointing to the vast new possibilities for coal which are opened up by the manufacture of a suitable home-produced fuel for all forms of internal-combustion engines. "The Motor" has recently been engaged in a vigorous campaign in the direction of home fuel, and its discovery of existing plants in the Midlands which are producing large quantities of a new spirit more efficient than petrol has caused something of a sensation. Readers of THE CYCLECAR should follow up the articles which will continue to appear in "The Motor," having for their object the encouragement of this great new industry, which is fraught with so much importance to the country and to every individual user of a motor vehicle. Mr. Bigland, M.P., who asked two important questions on home fuel in the House of Commons, contributes a letter to "The Motor" this week.

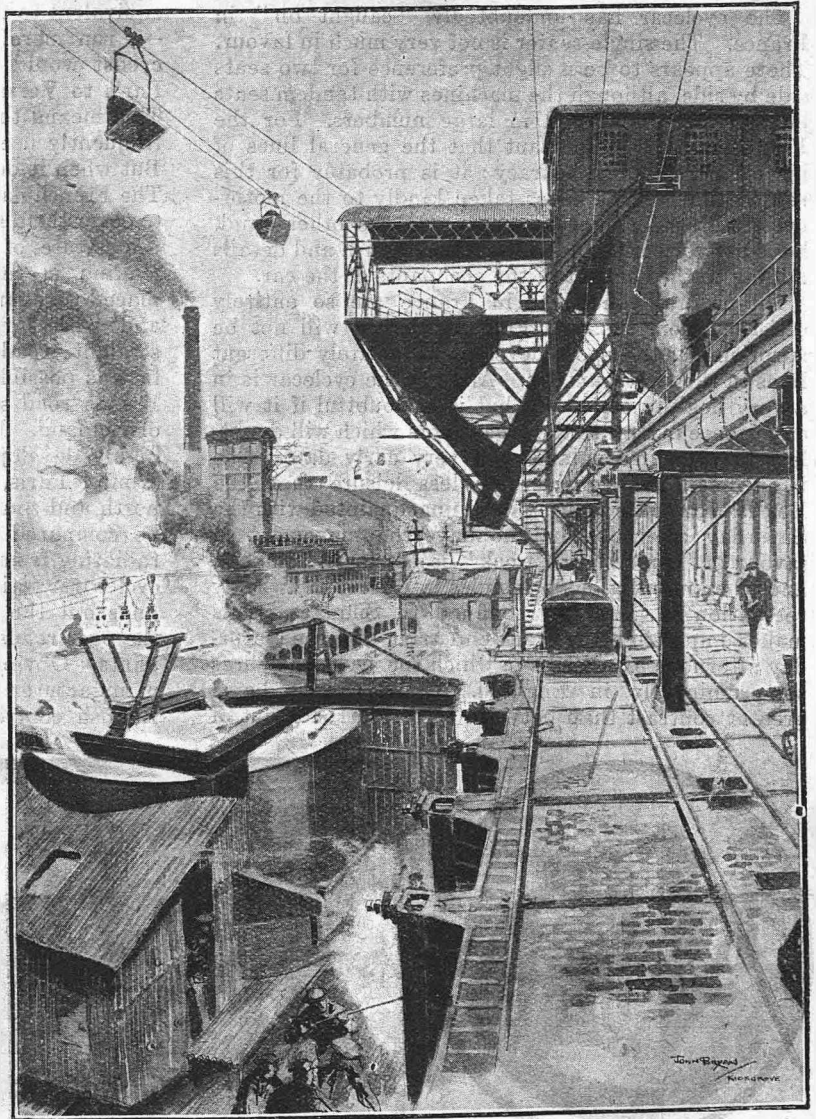
A Crushing Retort.

Some time ago I became possessed of the tariff plate from the inside of a provincial taxicab, writes a correspondent. You know the kind of thing; it is enamelled with the charge per mile (or part thereof); for waiting— $3\frac{3}{4}$ minutes (or part thereof); for parcels—each package (or part thereof), etc. This prize I screwed to the dashboard of my G.N., and it has been a never-ending source of amusement. The other day, when out with another G.N. owner, we stopped for tea, and left both machines outside the hotel. On coming out again, we espied the usual collection of Sunday experts gathered round our cars, and, coming up quietly, heard the following gem: The Knut: "Yes, they're a couple of Brooklands 'Has-beens.' Too old for racing, you know, so they use them up on the road. Oh, yes, I expect they're pretty fast—till they drop to pieces," etc. Presently one of the Knut's admiring audience happened to look inside, and read the heading of the taxi plate—"BRIXVILLE HACKNEY MOTOR CARRIAGE CO." "Why, they're only hackney carriages after all!" and with disdainful glances at our poor little cyclecars, as quite beneath their notice, they moved off, to gaze

at a new arrival. We climbed on board with down-cast eyes, metaphorically put down the flag, and drove out of sight as quickly as possible. There is a certain glamour, even a suspicion of a halo, around a "Brooklands 'Has-been,'" but a "hackney carriage." 'Ugh!

Novel Use for Steam.

Steam directed upon the petrol jet is said to increase the speed of a motor engine. An interesting device for obtaining this effect has been tried by a cyclecar manufacturer at Brooklands. Inside the bonnet a small water tank was placed, from which a copper tube was taken, and coiled round the exhaust pipe many times, the other end being directed to the top of the petrol jet. Naturally the heat of the exhaust pipe caused the water in the tube to be turned into steam, which, puffing out over the jet, is said to have added four miles per hour to the speed of the machine. There is no doubt a damp heat affects carburation, and there may be a good deal in the idea.



A NEW FUEL-PRODUCING PLANT.

Reproduced from "The Motor."
Birchenfield Colliery, Stoke-on-Trent. The whole supply of spirit is exported, and motorists cannot be supplied at present.

THE PASTIME AND INDUSTRY ABROAD.

How France, Germany and America Regard the Cyclecar.

FRANCE—UNRESTRICTED SPEED AND ITS EFFECT ON THE DEVELOPMENT OF THE CYCLECAR.

UNRESTRICTED speed and the monotonous, long, straight and not particularly smooth "Routes Nationales" are having a peculiar effect upon the cyclecar's development in France. Our correspondent in Paris points out that this makes the task of the French cyclecar manufacturer a very difficult one, for the demand is for machines capable of very high speed.

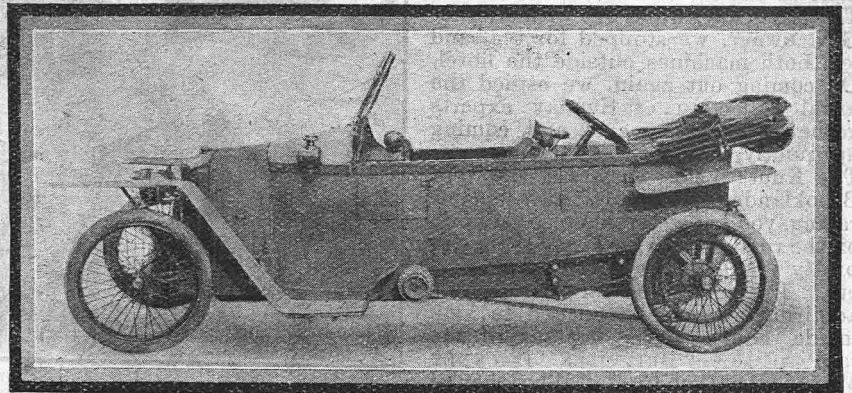
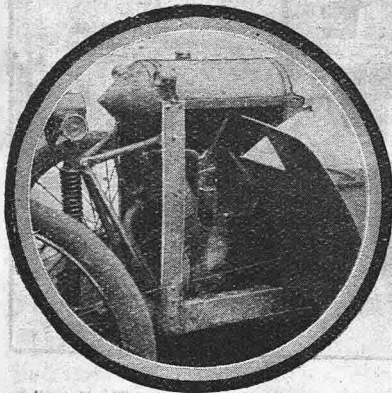
FROM OUR PARIS CORRESPONDENT.

The cyclecar has undoubtedly "caught on" in France. The single-seater is not very much in favour. There appears to be a slight preference for two seats side by side, although the machines with tandem seats have not failed to sell in large numbers. For the Frenchman it is important that the general lines of his cyclecar should be racy; it is probably for this reason that he has never taken kindly to the motorcycle with sidecar attachment. On the other hand, he is not very critical about external finish and details adding to the comfort of the occupants of the car.

All natural conditions in France are so entirely different from those in England that it will not be surprising if the sport develops on entirely different lines in the two countries. Already the cyclecar is in a very healthy condition, but it is doubtful if it will experience in France the great boom which will doubtless be seen in England at a very early date. The Frenchman has considerably less leisure than the Englishman. He is practically unacquainted with the Saturday afternoon half-holiday (the movement in favour of "the English week" is yet in its infancy), and when no religious principles interfere, the weekly recreation is generally confined to Sundays. This makes impossible the week-end trips and the Saturday afternoon excursions in which the cyclecar figures so prominently in England. There cannot be a greater contrast than between the main roads out of

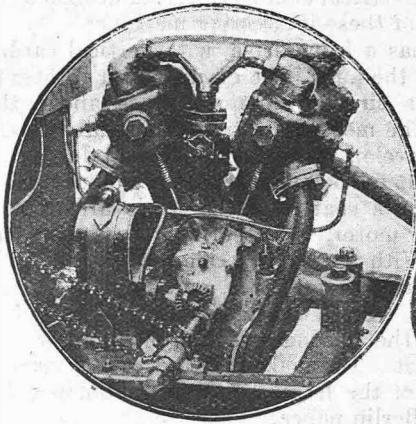
any large town in England on a Saturday afternoon and similar roads on the outskirts of a French town on the same day. In the one case the road is alive with cyclists, motorcyclists and all types of motorists abroad merely for the pleasure of being in the open air, while in the other case only the ordinary work-a-day traffic is on the road.

There is the further fact, too, that the young Frenchman, be he cyclist, motorcyclist or motorist, has not developed the habit of pottering along favoured highways. There is nothing, for instance, equivalent to the run from town to The Hut at Wisley—a run merely for the sake of the run. Even the cyclist would laugh at the idea of riding out from Paris to Versailles and back on a Sunday morning. This means that the cyclecar in France will be less frequently used than a similar machine in England. But when it does come out it is put to a harder task. The Frenchman's idea is to cover a long distance, and to cover the distance as quickly as possible. Probably the nature of his country and the system of road-making is responsible for the idea. With towns placed very far apart, the tendency is to go far afield; and with long, straight—sometimes monotonously straight—roads, there is a natural inclination to go as fast as possible. While being admirably engineered, French road surfaces are decidedly inferior to those of England. In the districts where motoring is most highly developed, in a radius of one hundred miles around Paris, and on the great highways running north and south, the French road surfaces are not to be compared with the fine tarred macadam roads radiating from London. All this is prejudicial to the cyclecar pastime, for sustained high speed quickly finds out the weaknesses of light construction, and the poor roads do not add to the comfort of the occupants. Obviously the task of the French cyclecar manufacturer is more complicated than that of his English confrere, for, in addition to making a fast

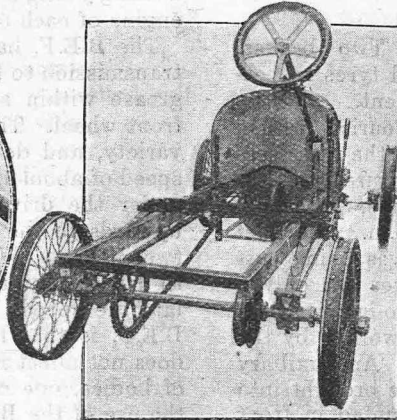


**TWO BELT-DRIVEN ::
FRENCH CYCLECARS.**

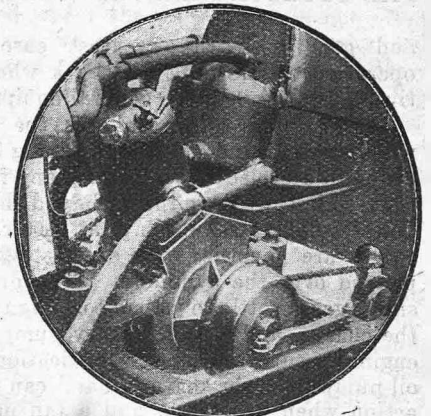
On left, the twin engine of the Bedelia, the original French cyclecar.
On right, another model with excellent points, the Automobilette.



TWO INTERESTING
FRENCH CYCLECARS.



In centre, the chassis of the Violette cyclecar, which is friction-driven, the final drive being by chain. On either side, the engine of the Lurquin-Coudert, a belt-driven type.



machine, he must produce one capable of holding to the road well at high speeds. It is hardly necessary to insist on the difficulty of building a very light car capable of running as if on rails.

In 1908, the writer, in conjunction with an English engineer, then living in Paris, drew up plans for what they termed a four-wheel motorcycle, which would undoubtedly come within the present definition of a cyclecar. It never got beyond the paper stage, but evidence that others were at work on the same problem was found in numerous letters and drawings sent to the editor of one of the French technical papers. In the early months of 1910, Messrs. Bourbeau and Devaux, two young engineers, appeared on the streets of Paris with a light belt-driven car

which they christened the Bedelia. Although this may not be the first cyclecar ever made, it was undoubtedly the first to be produced on a commercial basis in France. It is interesting to note that, although it has undergone numerous detailed improvement, the main features of the Bedelia of to-day are identical with those of the first model sold in March, 1910.

It has been followed by a number of other cyclecars, the makers of which have taken their inspiration from this interesting type. The Violette was an early comer; others were the Lurquin-Coudert, the Ponette, the Bébé and the Automobilette. In addition, a large number of cars on the border line between the light car and the cyclecar were produced.

GERMANY—NOT MAKING PROGRESS.

MOTORCYCLING in Germany is declining. It is therefore not surprising to find that the cyclecar has made very little headway in that country, although, as our correspondent at Berlin points out, there are several interesting types of machine, mostly three-wheelers, in use in the principal cities.

FROM OUR BERLIN CORRESPONDENT.

Hostile legislation and vexatious police regulations have given the motorcycle movement such a set-back in Germany that it is not surprising to find the cyclecar developing on motorcar lines. The opposition of the authorities to road trials and an absence of that sporting spirit which is so characteristic of England scarcely encourage the development of any new type of vehicle. However, there are exceptions, and the most notable machines following lines that are popular in France and England may be described.

By far the most popular type is the Cyklonette, a front-driven machine. The two-cylinder engine is mounted above the fork of the front steering wheel, and cooled not only by usual horizontal flanges, but also by a supplementary and distinctive vacuum cooler, closed on all sides, and ribbed outside. This supplementary cooler is screwed into the cylinder head above the exhaust valve. It is free of air, but contains a small quantity of liquid, which, with the engine

at work, vaporizes in the lower section, recondenses in the upper, and, having flowed back again by force of gravity, is subjected to the same cycle of changes. It is quite automatic in its working and very effectual. A camshaft driven by the crankshaft works the mechanism of the battery-ignition, and controls the inlet and exhaust valves. The transmission is effected through planet gear, chain and sprocket, whilst the gearing, fork and driving wheel constitute a compact whole. The steering rod has its front end firmly connected with the fork, its rear end terminating in a convenient handle in front of the driver. Three small levers are mounted on the steering rod for regulating the timing, and control the air supply and throttle the gas respectively. The makers have adopted a surface carburetter.

Another cyclecar on nearly identical lines to the foregoing is the Phanomobile. Unlike the Cyklonette, its two cylinders are mounted V-wise, one behind the other, with two cooling fans. The transmission is through gear to chain and sprocket, and two silencers, mounted tandem-wise, ensure an almost noiseless exhaust. Battery ignition is used, and a variable gear, the free engine clutch being mounted in the hub of the front wheel. The makers use a Longemare spray carburetter. The tank holds enough petrol for a run of 150 miles, whilst levers on the steering rod enable the driver to control engine

THE CYCLECAR ABROAD (contd.).

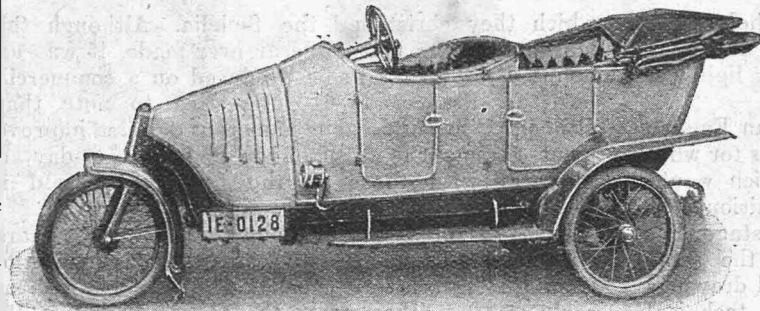
and gear with the greatest ease. Two brakes, operating on the hubs and back wheel tyres respectively, form part of the general equipment.

A third interesting make is the Tourist, which, while, perhaps, not quite conforming to the rigid definition of a cyclecar, possesses many features peculiar to it. First, we have the V-shaped engine, air cooled, and developing some 7 h.p. at 1600 r.p.m. The inlet valves are governed, the exhaust valves being suspended over the cylinders. The driver has only a single gas throttle to attend to. Magneto ignition fires the charge, and a small rotary pump, worked by the engine, secures automatic lubrication. An auxiliary oil-pump near the driver's hand can be brought into action when necessary, and a fan mounted in front

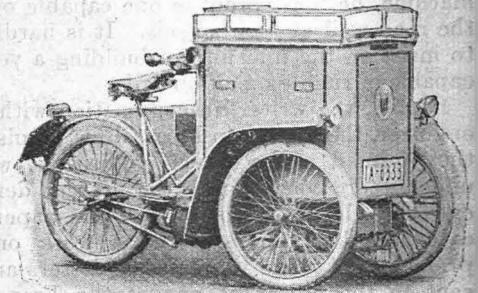
a rising young electrical engineer, having designed the engine of each of these interesting machines.

The B.E.F. has a front drive, with vertical cardan transmission to the hub. The electromotor rotates in grease within a circular dustproof case above the front wheel. The motor belongs to the main-current variety, and develops 4 h.p., or sufficient for a top speed of about 15 miles an hour. Its accumulator lies under the driver's seat, and the leads are carried upwards to the motor, the steering rod passing between them. With the help of this rod it is possible to drive backwards or forwards, and steer and regulate the speed. One of the advantages of the little B.E.F. is that the burdensome Motor Liability Act does not affect it. The make is fitted with a variety of bodies, one of the latest being an ambulance for the use of the Berlin police.

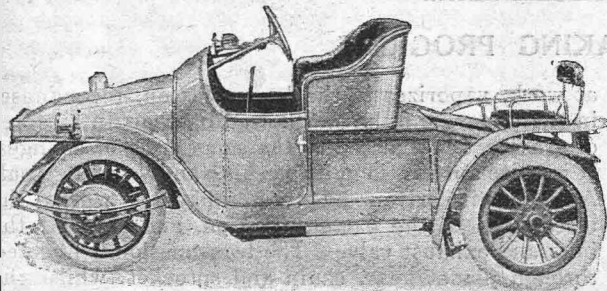
FOUR GERMAN THREE-WHEELERS.



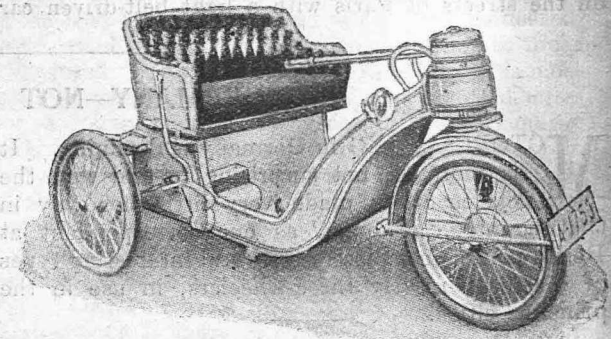
The Tourist, with engine in front, driving by chains.



The Siemens and Schuckert electric tricycle.



The Geha, with electric front hub motors.



The B.E.F. with electrically-driven shaft to front hub.

of the engine assists radiation. By means of two dog clutches, which engage with the high or low gear, as many speeds are possible, including, of course, a free engine. As the Tourist can turn in a road some 10 ft. wide, the makers have not thought it necessary to arrange for a reverse speed. Transmission is by chains from a secondary shaft, with lightly-demountable sprockets for rapidly adapting the vehicle to varying gradients. Special attention has been paid to the springing, and a hand and a foot brake are fitted. The car is steered through a pair of bevels by wheel and pillar.

We now come to some electric-driven cyclecars—the B.E.F. (Berliner Elektromobil-Fabrik) and the Geha (made by Messrs. Gebhardt and Harhorn). The B.E.F. is the predecessor of the Geha, Herr Harhorn,

As to the Geha, this incorporates a more ambitious type, and is particularly notable in the peculiar mounting of the front wheel under a broad, flattened nose or bonnet. In the Geha, Herr Harhorn employs main-current hub-motors, the magnet housing forming the hub, which, with the spokes and fork, consists of one cast. The axle of the wheel around which the motor rotates is rigidly attached to the wheel bracket, intermediate gear causing the wheel to revolve. No sooner does the armature begin to revolve than it drives the gear in question, which, in its turn, engages with a gear ring on the hub. Consequently, the drive is practically direct. The intermediate gear is of raw hide. Steering is on car lines, with wheel and self-locking worm gear. Gehas are turned out in various sizes, and many different bodies are fitted,

THE CYCLECAR ABROAD (contd.)

the lightest weighing about half a hundredweight. Speed and direction of travelling are controlled by a single switch, which moves in one way only.

The Siemens and Schuckert, which is a tricycle with electric propulsion applied to the back wheel through the agency of a shaft and bevel wheels, the cells

being suspended under the goods box, is not often met with, and has, we believe, been as yet restricted to the transport of light goods, weighing collectively some 1½ cwt., such as mails and small parcels. They are smart little vehicles, and caused a bit of a sensation when they first appeared in Berlin, but they have not quite come up to expectations, which is surprising when one considers the great reputation of the makers

AMERICA--FIELD FOR RAPID DEVELOPMENT.

THE following authoritative article, kindly written specially for *THE CYCLECAR* by Mr. David Beecroft, the managing editor of "The Automobile," of New York, indicates that the cyclecar has not yet been evolved in the United States of America, but that it is bound to come. In a covering letter Mr. Beecroft adds significantly: "I believe that if the cyclecar were taken up by our best makers and put out in a rational form, and every effort given to marketing it rationally and keeping special jurisdiction over its operation, the field for it could be rapidly developed."

There is not practically any cyclecar movement in America, if by cyclecar is meant a three-wheel vehicle drafted on the general lines of a motorcar, or if the cyclecar stands for the miniature four-wheeled vehicle with a track ranging from 36 in. to 40 in.

American roads are not good enough for such vehicles. There are tens of thousands of miles of roads in rural America on which motors are operated, but where the smooth road

surface is confined to a path approximately 1 ft. wide near the right side, and a similar path at the left, each path providing a suitable surface for the right and left wheels of the vehicle. These paths are 56 in. apart, entirely suitable for a standard-track motor, but entirely unsuited for a narrower track. With the 40-in.-track cyclecar it would be possible to have but the two right-side wheels on the smooth surface, with the two left-side wheels travelling over rough road, perhaps stones, or dropping into deep holes or ruts.

It is true that in many states the good-roads movement has been making amazing progress within the last two to five years; New York State now has hundreds of miles of perfect bitumen roads, wider than the main thoroughfares of England, but often these are not connected into one continuous system, necessitating going over connecting links of 5 to 10 miles where the cyclecar would be piloted with difficulty.

America has one concern which has been building three-wheeled cassettes, but, owing to financial difficulties, little has been done. The American public agrees that it is difficult enough to guide a four-wheeled vehicle over average roads when the track is standard width, and that to pick a smooth surface for a single front or rear wheel, which must take the middle of the road surface, is a difficult problem.

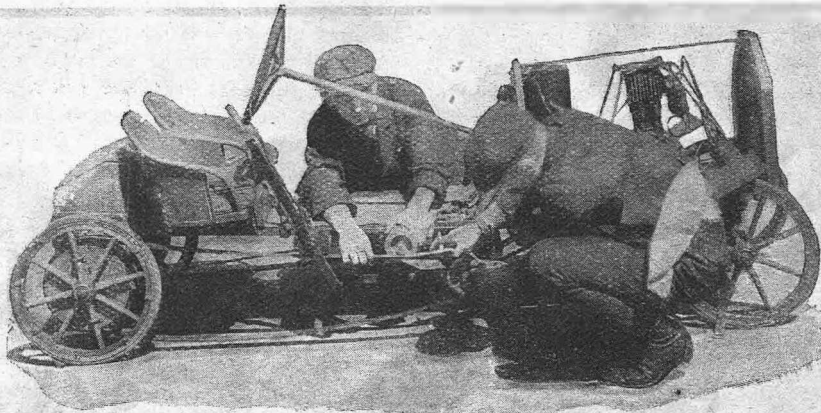
Several of the concerns building motorcycles in America have developed for city use what they have designated a tricar, which is really a motorcycle and sidecar. These are in use in cities and parks, but their growth has not been up to the conceived possibilities of some years ago. In general the wicker-seat attachment does not appear robust enough for the speed of the motorcycle, and, again,

the motorcycle proper appears to be overloaded and worked beyond capacity with its side attachment.

A cyclecar type of vehicle was brought out in America over five years ago for light delivery work. It consisted of a three-wheeled chassis developed from a motorcycle design, with two front wheels and

a carrying box between them. The driver sat in the rear of the carrying box and in front or over the motor, which was mounted as closely as possible to the single driving wheel in the rear. These little carriers had too much speed for their strength, and were soon racked to pieces by the boy operators, who drove them entirely too fast. Some of the big Chicago and New York department stores purchased fleets of a score or more of these, and placed boy operators on them all, men refusing the jobs. It was only a matter of a few months before the repair bills became too heavy, and the service was discontinued. To-day these same merchants are using more expensive gasoline and electric vehicles for their delivery service.

There is not a question of doubt but that the cyclecar will come in America, but to-day conditions are not ripe. All of our big cities have hundreds and thousands of merchants who could make use of them.



YOUNG AMERICA HAS IDEAS.

America has not yet awakened to the possibilities of the cyclecar, but two Philadelphian youths have constructed the miniature four-wheeler which is illustrated above.

THE CYCLECAR ABROAD (contd.).

These merchants cannot afford to spend \$1000 (£200) for a motor truck or delivery wagon, and, as a consequence, they continue with the horse. The desire of these merchants to substitute motor power for horse power is exhibiting itself in many quarters by the small grocer who wishes to buy a motor on credit. He operates on small capital, and will take a chance with a motor vehicle if he can pay \$200 at time of delivery and \$200 per month, or every two months, until paid for. Many of them are willing to assume such an investment because of the possibilities of increasing their business due to the quicker delivery service they can offer, and also because of the extended field of customers they are enabled to cover.

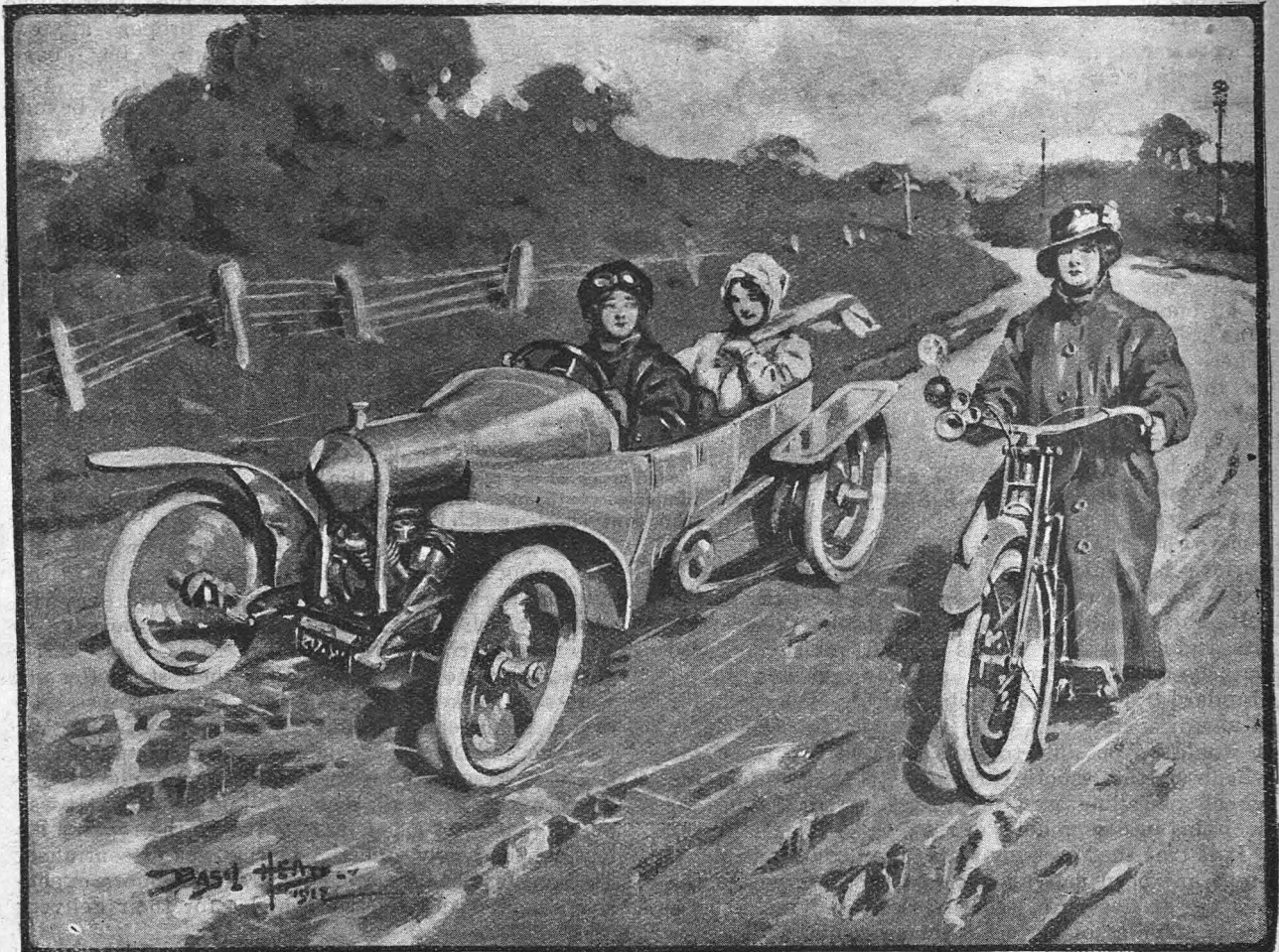
The constantly-reduced prices of small pleasure cars of standard sizes will practically bar any possibilities of the cyclecar in this field. The Ford prices are now \$600 (£120) for a touring car, and the fact that they are aiming at building 150,000 next season shows how widespread is going to be the advertisement for the real car by advertising and selling campaigns. Studebaker will announce during November a big reduction in prices of cheap cars; and some

other companies are following the same course. All of this makes it the more difficult for the cyclecar.

Four or five years ago the motor buggy was looked upon as a coming factor in the motor field, by the motor buggy being meant a motor vehicle with wheels as high as used on a horse-drawn vehicle, and also shod with solid rubber tires. It was thought that the duplicating of appearances of the horse-drawn vehicle would sell the motor buggy. For a time it did, but just as soon as Ford and others brought their prices down, the motor-buggy people all went out of business; and in a few months upwards of two score had started on the downward and final movement. To-day the motor buggy is scarcely heard of. To-day everybody is looking for a real car with real car speed and real car appearances.

"The Cyclecar Manual."

All thinking of taking up cyclecarring should order a copy of "The Cyclecar Manual," which it is hoped will be on sale by the middle of the week. A specimen copy can be seen at THE CYCLECAR Stand at Olympia (just round to left on entering from Addison Road), and orders given. The price of the new manual is 1s., and a special feature is "Cyclecars of 1912," all leading makes being illustrated.



**THE LADY
DRIVES.**

Driving a motor-bicycle presents no difficulty to many practical lady riders; how much simpler and safer is the cyclecar! We predict that thousands of ladies will take up cyclecarring, for it is the ideal of motors for feminine use.

WELCOME TO A NEW INDUSTRY!

Gigantic Possibilities for the Cyclecar Trade.

By L. G. CHIOZZA MONEY, M.P.

Mr. L. G. Chiozza Money, the well-known statistician, points out that, apart from those who now own cars, there are "at least" 350,000 people in Great Britain who could afford a cyclecar. He arrives at his figures by taking the official returns of the annual rental of private dwellings. When to the figures available are added the possibility of more than one cyclecar user to a household, the inhabited upper parts of shops, and those who live in chambers, flats, hotels, etc., this figure, large as it is, could be easily multiplied.

THE publication of THE CYCLECAR is of no little social and industrial importance. It is at once evidence of the existence in the United Kingdom of a considerable body of persons able to afford an expenditure which would have been prohibitive to all but a very few half a century ago, and of the insight and enterprise of British engineers in gauging and meeting the demand for a light and inexpensive mechanically-propelled vehicle. It also indicates that the social delight of possessing the means of rapid and convenient transit, under one's own control and available at a moment's notice, is not to be confined to the select, but is to be placed at the disposal of an ever-widening circle of families.

No industry can attain great importance or great dimensions which relies upon a limited rich market. That fact is very often forgotten by those engaged in commerce. Nowhere in the world, save in certain parts of the United States, are there so many well-to-do people clustered together as in the United Kingdom. Nevertheless, while their number is actually great, it is relatively small. It is a market the limits of which are soon found by the manufacturer. In Great Britain there are only 68,000 private dwelling houses of an annual value of £100 and upwards, and that striking fact helps us to understand that the engineer who confines his attentions to a rich market has only a very limited sphere of operations even in such a rich country as this.

Cars for the Many.

With each lowering of the initial and maintenance costs of a car, the engineer's market widens greatly—how greatly ought to be fully realized. Taking the latest returns of the Inland Revenue Commissioners, we find that the private dwelling houses in Great Britain (there are no figures for Ireland, because the Inhabited House Duty is not charged in that country) of an annual value of between £20 and £100 a year are as follow:—

PRIVATE DWELLING HOUSES OF AN ANNUAL VALUE OF BETWEEN £20 AND £100 A YEAR.

ANNUAL VALUE.	NUMBER.
£80 and under £100	39,000
£61 " £80	65,000
£41 " £61	232,000
£20 " £41	1,088,000
Total	1,424,000

Looking at these facts from the point of view of the motorcycle and motor trades, we can form an idea of the possibilities, and we can quite clearly see that the number of people able to afford a car costing several hundred pounds, and able to maintain it, is relatively few. Just as clearly there is an enormous market for motorcycles, which, from their small dimensions, are easily housed, which may be bought new or second-hand at low or moderate prices, and which cost a fraction over a penny a mile to run, everything in.

350,000 Possible Cyclecarists.

It is also evident, from the facts given, that the new and exceedingly interesting industry of cyclecar manufacture enters a field of very large possibilities. Let us take the houses between £41 and £100 a year, and add to them a proportion of those that lie between £20 and £41. Between £41 and £100 a year there are no fewer than 336,000 households the heads of which may be assumed to be in the possession of anything between about £400 and £2000 a year. Between £20 and £41 a year there are 1,088,000 households, and, in view of the fact that these cover both urban and rural dwellings, we may assume that at least 100,000 of them are occupied by persons who could afford a cyclecar. At the upper end of the group we are considering, i.e., near the £100 limit, we reach households which can afford, and in many cases already afford, a motorcar proper. There is thus a little uncertainty at each end of the scale, but it certainly appears that we should not exaggerate if we put it that there appears to be a possible market of at least 350,000 persons in the United Kingdom who could afford to maintain a cyclecar, and I should not quarrel with an estimate which put the figure higher than this.

The Housing Difficulty.

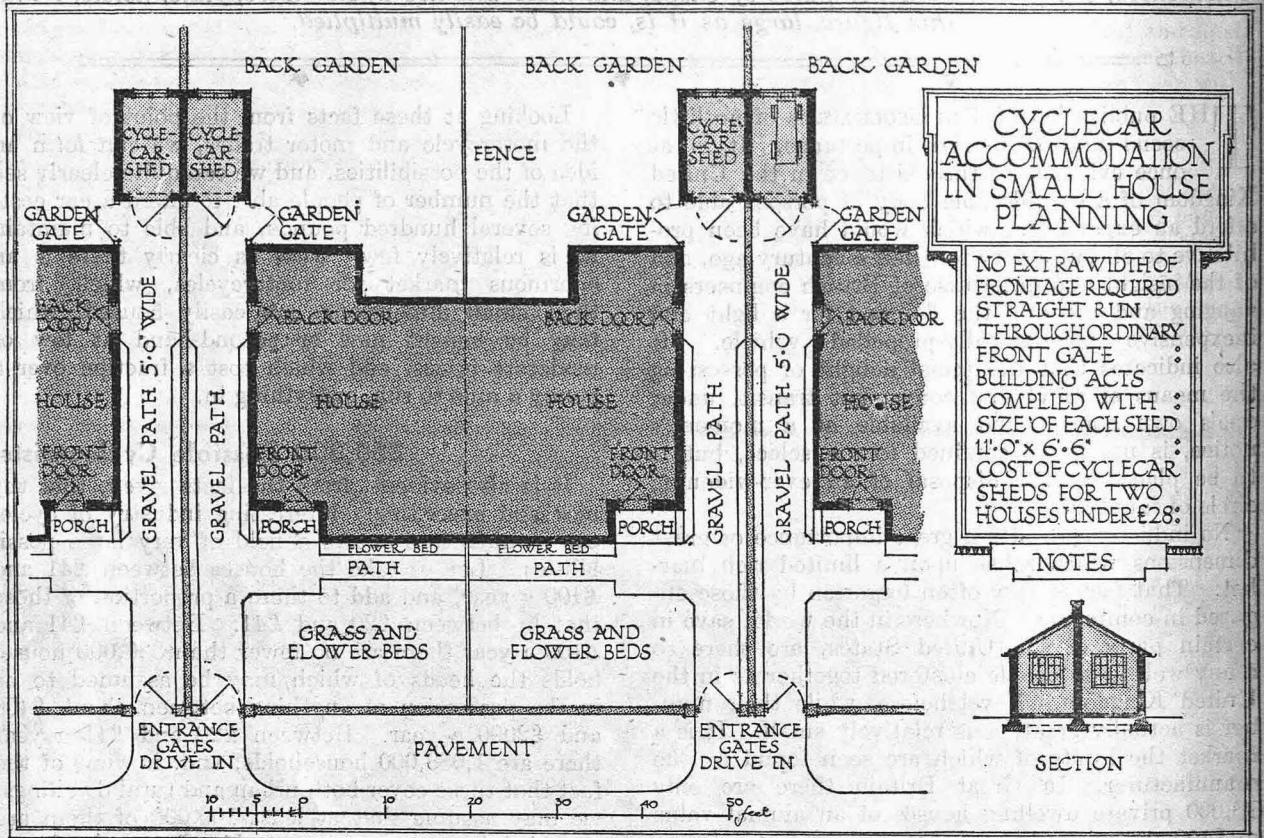
One practical difficulty obviously stands in the way of the cyclecar maker, and that is the fact that a considerable number of people included in this possible market live in houses which make it impossible or difficult to house even a small car. There are, of course, large numbers of terraced houses in our towns without any outlet to what is euphemistically termed the "garden," and many of the semi-detached and detached houses are built so closely together that the small passage-ways.

WELCOME TO A NEW INDUSTRY (contd.).

between them would not allow the passage of a cyclecar with even so small a track as 3 ft. 2 in. This, however, is a difficulty which the increasing attention that is being given to the housing question will remedy rapidly during the next 10 or 20 years.

The facts I have given relate to private dwelling houses only. It ought to be added that there are a very large number of residential shops, etc., which,

costly to run. What is wanted, certainly in tens of thousands and, perhaps, in hundreds of thousands of cases, and what there exists a great and growing market for, is a light and simple vehicle which does not pretend to be a swell motorcar, the dimensions of which do not exceed about 7 ft. in length and about 3 ft. 6 in. in width, the working parts of which are of studied simplicity, the weight of which does not exceed 6 or 7 cwt., and the cost of running which is exceedingly low. If British cyclecar manufac-



THE HOUSING PROBLEM.

How the difficulties of providing cyclecar accommodation in small house-planning may be overcome, at the same time complying strictly with the Building Act.

in some cases, house persons who are well able to maintain a cyclecar. Some tens of thousands of possible customers are certainly added by this consideration.

There is also the question of the growth of the market. We find that houses rented at £41 to £61 a year have increased by nearly 20 per cent. in the last 10 years, while £61 to £80 a year houses have increased 16 per cent. in the same period, the actual additions being 52,213 and 13,549 respectively. Thus, of the houses which may reasonably be supposed to represent possible cyclecar buyers, nearly 66,000 have been added in Great Britain in the last 10 years. That is a very encouraging consideration for the cyclecar maker.

It seems to me that the chief lesson to be learned from a study of the essential factors regarding the size of the market is that the cyclecar manufacturer will do well to study simplicity, and to resist the temptation to make his machine unduly big and

turers will keep these aims before them, they may rest confident that they have at hand a magnificent market. If, on the other hand, they pile up costs and lose sight of the fact that, as they do so, they are shedding possible customers and contracting their sphere of operations, they may lose what is undoubtedly one of the finest opportunities that have ever presented themselves to the British engineer.

The accompanying suggestion for cyclecar accommodation in small house-planning has been specially prepared for THE CYCLECAR by Mr. S. J. B. Stanton, of 14, Gray's Inn Square, London, W.C. The chief difficulty in providing special accommodation for any motor vehicle is that of working in a very restricted space. The plan reproduced, however, does not increase the average width of frontage of a semi-detached house with a rental of about £40. The garden gate is so placed that the cyclecar can be turned round and driven out.

The Cyclecar

Wednesdays—1d.

Conducted by EDMUND DANGERFIELD.

TEMPLE PRESS LIMITED

Proprietors of "MOTOR CYCLING,"
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EDITORIAL Communications should be addressed to The Editor, "The Cyclecar," 7, 9, 11, 13 and 15, Rosebery Avenue, London, E.C.

Letters relating to ADVERTISEMENT and PUBLISHING Departments should be addressed to The Manager.

Press Times.

IMPORTANT LATE NEWS and Photographs can be accepted up to first post Monday morning for insertion in the following Wednesday's issue.

ADVERTISEMENT COPY, Blocks, &c., should come to hand by Wednesday morning to ensure careful attention and allow time to submit proofs, except when an earlier time is specified.

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SPECIAL FEATURES NEXT WEEK.

The Four-wheeled Single-seater—
its Tremendous Possibilities.

The Co-operative Garage—a Great
Scheme of Economical Storage.

Efficiency of Belt Drive.

MANY NEW CYCLECARS NOT
EXHIBITED AT OLYMPIA,
WILL BE ILLUSTRATED AND
DESCRIBED FOR THE FIRST
TIME IN No. 2 OF "THE
CYCLECAR."

Advertisements of Cyclecars for Sale,
new or second-hand, Sundry Announce-
ments, and Rates for Advertisements,
will be found amongst the end pages.

Topics of the Week

NO. 1 of THE CYCLECAR makes its appearance to-day to carry on a movement originated by "Motor Cycling." In its pages the subject of the new motoring and the new industry that is arising can be dealt with on altogether broader lines than has been possible hitherto. We do not recall any similar movement that has progressed so rapidly since its inception.

The New
Motoring

It is less than two years ago that a series of articles in "Motor Cycling" drew attention to the vast possibilities of the miniature car, built on the simplest motorcycle lines—the cyclecar. The few machines described in the issue of "Motor Cycling" for 6th December, 1910, are now represented by an industry in which 70 manufacturers, large and small, are giving serious attention to the handy, light, cheap, efficient and economical motor vehicle. Their numbers are being added to weekly, while close on 40 different makes are being exhibited at Olympia.

* *

THE future of the new industry, now in its infancy, can be gauged from the first issue of THE CYCLECAR. The printing order for No. 1 is for 80,000 copies at the moment of going to press. The advertisement pages prove that the new industry has undoubtedly made an excellent beginning. We have now completely answered those few who, for their own purposes, have contended that the subject can be covered fully in the pages of a motorcycling or any other motor journal. Fostered hitherto by "Motor Cycling," the movement has now assumed such vast proportions that it can only be dealt with adequately in the pages of its own weekly newspaper, and the cyclecar will no longer continue to monopolize space in a journal where it is really outside its sphere. The cyclecar will appeal to tens of thousands who will not ride the motor-bicycle, and who will prefer the new machine with its low first cost, economical upkeep, and convenience of storage, to the ordinary motorcar. Not the least of its advantages is that it demands no previous experience of cycling, motorcycling or motoring. Simple to drive, economical to run, a motor within the reach of hundreds of thousands—surely we are on the threshold of a movement that can only be described as vast?

A Fast
Movement

* *

IF the new industry that is arising is taken in hand vigorously, and with the characteristic thoroughness of British business methods, it will soon be as firmly established in this country as the manufacture of the motor-bicycle. The pre-eminence of the British motor-bicycle proves how little this country has to fear from foreign competition when a new movement is vigorously undertaken. Neglect of this great field for a new industry by the British manufacturer would make the way easier for an invasion from abroad. The makers of low-priced American cars in all probability would themselves evolve a cyclecar at a figure less than that of their cheapest cars now, should we leave an opening for them. This possibility is overlooked by those who urge that the American car as we know it now will starve the cyclecar market. Further, the simplest type of cyclecar offers lower running costs and greater ease of storage than the cheap light car. It must be simple, if it is to find a market beyond the restricted field of motorcyclists and motorists, and simplicity should ensure low first cost and economy of upkeep. As Mr. Chiozza Money, M.P., points out in an interesting article on another page, "What is wanted, certainly in tens of thousands, and perhaps in hundreds of thousands of cases, and what there exists a great and growing demand for, is a light and simple vehicle which does not pretend to be a swell motorcar." There is no doubt about the demand, which for some time to come is likely to exceed the supply. With a number of concerns cyclecars are now being made on a commercial scale, but delays may occur where much careful testing must be done before entrusting new machines to inexperienced hands.

Progress
Abroad and
at Home

TOPICS OF THE WEEK (contd.).

WHEN, at the meeting convened to form the Cyclecar Club, some thirty actual owners of cyclecars stood up in response to the invitation of the Chairman, some surprise was expressed. Few had an idea that so many actual cyclecarists were present, and to those familiar with the sport and pastime of motorcycling for many years past their names and faces were unknown.

New to Motoring

It was striking proof of the fact that the cyclecar is attracting those who would not make an entry into the world of wheels on any other machine. It answered the suggestion, actively put forward during the past few weeks, that those who are interested in the formation of the Cyclecar Club should join the Motor Cycling Club instead. Those responsible for this suggestion should get into touch with a few practical cyclecarists who have not begun their motoring experiences with any other type of machine. They will find a new spirit of enthusiasm which will not be stifled by a motorcycling organization, and in which the interests, if they do not clash, do not intermingle.

* *

IN many of the letters we have received, some fear is expressed that the cyclecar will develop on too luxurious lines, and a movement that promises so well will be checked at the outset. It should be obvious, however, that the future of the cyclecar depends less upon the manufacturer than the user. If some makers encourage the evolution of the "light" car, with the fixed idea that the cheap American motor is the only type that counts—well, let them.

Over Development

It is obvious that, however low the price of the more luxurious vehicle, something altogether simpler, more convenient, and less expensive to run can be evolved at a lower cost still. Over development may take place, but this will mean simply that the too-expensive designs will, ipso facto, leave the cyclecar field and enter the market for light cars. The true cyclecar industry will remain unaffected, and will continue to make use of the best motorcycle practice in design. We feel sure that the demand for the cyclecar exists, chiefly amongst those unattracted by the motorcycle or the motorcar. Either there is nothing in the new movement or it must of necessity prove a vast thing, appealing to tens of thousands possessing comparatively small means. The next few months should prove the magnitude of that demand.

* *

THE cyclecar will undoubtedly form the chief attraction at the Olympia Show this week. The four-wheeled models are being exhibited for the first time since the joint committee of the R.A.C. and Auto-Cycle

Olympia and the Cyclecar

Union evolved a definition of a cyclecar and decided that the motorcycling organization was to control vehicles of this type. Before then the four-wheeled cyclecar was considered outside the sphere of a cycle and motorcycle Show. Hence the very novelty of these light four-wheeled miniature motorcars will appeal to the public. The movement is still in its infancy, and for this reason there is no standard design in cyclecars. The machines at the Show exhibit a delightful originality, unfettered by the hackneyed conventions of fashion. There are one, two, and three-seaters; three-wheelers and four; belt, shaft, chain and friction drive; and various designs of body and chassis work. In fact, there are machines to suit every taste, the price varying from 70 guineas to twice that amount. Those who have been waiting for the £100 car, those to whom the motor-bicycle and what is known as the light car have never appealed—they are the people who will be attracted by the new motoring making its bow at Olympia to a critical public. This year the Show will be visited by hundreds of those who up to the present have known nothing of motoring. The smallness, simplicity, and neatness of the cyclecar are the qualities that will appeal to them. Convinced at last of the possibilities of the miniature motor, now an actuality before their eyes, those interested hitherto in no form of motoring will find themselves in the grip of the new movement, and the thirty or forty machines exhibited at Olympia this week will afterwards be regarded as the nucleus from which sprang an industry of gigantic proportions. This year's Show will make history.

LEADING NEWS.

The new industry has vast possibilities for talent, capital, and labour. On page 1 we proffer our services in bringing together men with practicable ideas and those on the look-out for sound investment.

The hour record has again been broken. Nearly 60 miles were covered. Page 2.

The production of home-distilled fuel is a question of vital importance to the cyclecar movement, as its effect upon the price of petrol is likely to be very great. The discovery of such a spirit having an efficiency 25 per cent. higher than that of petrol is announced. Page 5.

French, German and American correspondents of THE CYCLECAR report tremendous possibilities for the miniature motor in France and the United States, but in Germany, owing to the lack of interest in the motorcycle movement, the cyclecar pastime has not yet made a beginning. Pages 6-10.

The question of providing cyclecar accommodation in small house planning is referred to by Mr. Chiozza Money, M.P., who places the possible users of cyclecars at 350,000. Pages 11 and 12.

The uses of a cyclecar as an auxiliary to a more powerful motor are illustrated on page 20.

A novel two-stroke engine is described on page 21.

A wonderful engine giving 15 h.p. for 499 c.c. is described on page 22.

The cyclecar will call for many special accessories. Some are referred to in the article on pages 22-23.

The Show Report in the first number of THE CYCLECAR takes a line of its own. Instead of many pages of detailed description, a critical and reasoned review of the various models is given, together with illustrations and specifications, commencing on page 25.

There are close on 40 different makes of cyclecars exhibited at Olympia. Pages 25-42.

A plan of the Olympia Show will be found on page 26.

A Show sensation is a single-seated four-wheeler priced at 70 guineas. Page 28.

The Perry cyclecar, evolved by a company with a capital of £60,000 specially devoted to cyclecar production, is illustrated for the first time on page 28.

The possibilities of the cyclecar for ladies are unbounded. Miss Berend relates her experiences of a first run on page 46.

Running costs of the cyclecar will prove one of the most interesting topics for discussion. An article by Mr. Frank Thomas on page 47 offers some useful information. He considers the cyclecar is cheaper to run than the sidecar.

Mr. H. E. Dew raises a very interesting topic for discussion in a strongly-worded suggestion that the cyclecar trade has most to fear from over-development. Page 50.

NOTES & QUERIES

Readers' Problems Investigated
by The EDITOR

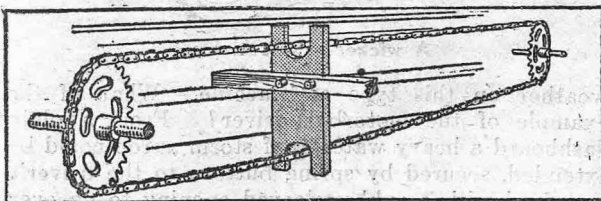
Readers are asked to write on one side of the paper only, and to use a separate slip for each question.

I REMEMBER my first experience of driving a cyclecar. It was with a certain amount of trepidation that I felt for the various pedals, gripped the steering wheel, trod on the accelerator and slowly tightened the belts. The machine took up the drive gently, for, with the belt type, you cannot very well make one of those jerky Brooklands starts that scatter a cloud of dust and spell havoc to the tyres. The steering felt very curious, and for a hundred yards or so I made a zig-zaggy course, until the machine was under way and I had the right touch of the wheel. Then all was plain sailing, and less than a mile gave me a feeling of perfect confidence in driving.

QUITE SIMPLE. MANY readers have got to go through this experience, but it need raise no qualms. Keep cool, throttle down the engine, drive slowly and bear in mind the brakes. It is always easy to stop; it is not so simple as it might appear to get out of a tight corner. I expect to hear from a number of readers who have taken the initial step in cyclecaring, and shall be pleased to give advice on various subjects. Abstruse technical queries will be answered by a qualified engineer, while THE CYCLECAR has also retained a lawyer to reply to legal queries. All replies are given by post.

VARIABLE PULLEYS. A CORRESPONDENT hailing from Dorset, who is at present engaged in building a cyclecar, asks a few questions, the replies to which might be of interest to others. The design he proposes to follow is on true cyclecar lines, incorporating belt drive with variable pulleys. It is with regard to this that he asks what is the greatest change in diameter in a variable pulley, 4 in. being that used when the lowest gear is in service. Several points have to be taken into account, naturally the most important being the method of taking up the slackness of the belt. In general, however, I think that he might expect the maximum diameter to be about 6 inches.

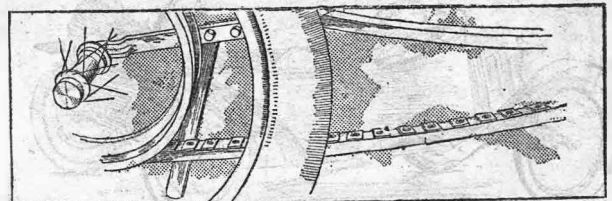
PULLEY ANGLE. MANY readers, perhaps, wonder, as our correspondent does, what is the correct, or rather the standard, angle, used for V belts. It is a most important matter to see that not only the belts but the pulleys themselves are correctly made with an angle of 28 degrees. Very often, after considerable time, the pulleys will be found to have worn slightly inside; it is then necessary to have them refaced so that they may grip the belt satisfactorily, which is only possible when the angle of each is 28 degrees.



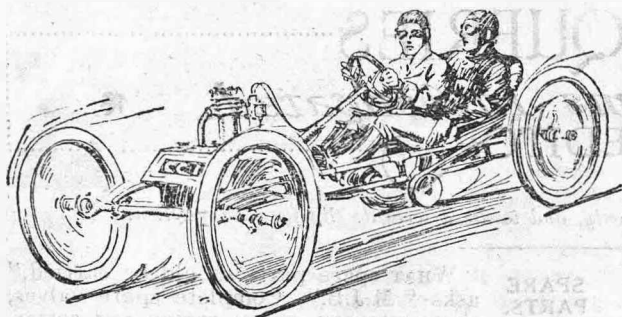
SPARE PARTS. "WHAT spare parts should be carried," asks "M.J.B." Complete spare valves, that is to say, valve, spring and cotter, are essential, but if the exhaust and inlet are interchangeable, it is only necessary to carry one. A few spare links for the chains, along with an extra belt fastener, and a small length of belt, should be carried by users of this transmission. An inner tube, a tyre repair outfit, and an extra sparking plug are also necessary spares. To guard against all contingencies, add the following parts:—A carburetter jet, a contact breaker complete for the magneto, also a high-tension brush holder, an extra length of high-tension wire, an outer cover, and an acetylene lamp burner or electric bulb, while a piece of rubber tubing may come in handy to repair a broken petrol pipe.

CHAIN TROUBLE. THE cause of chains leaving their sprockets is asked. In the majority of cases this is entirely due to an abnormal slackness of the chain, and when this is noticed steps should be taken immediately to make the necessary adjustment. So far, so good. But after another little burst of speed perhaps the chain parts company once more with its sprocket. This is generally due to the engine shifting after a previous adjustment. On the majority of cyclecars having chain transmission from engine to countershaft the means of increasing the chain tension is effected by moving the engine forward in the frame. After an adjustment has been made, care should be taken to tighten up all the engine bolts, so as to prevent the engine being pulled back to its original position by the strain on the chain. If this is done, the trouble will be got rid of, unless the two sprockets are out of line. That one on the countershaft may be loose, and capable of moving laterally, or else the whole countershaft is provided with an excess of end play, which allows misalignment to take place. I have also known a case where a bent countershaft was the cause of all the trouble.

BELT TROUBLE. AMONG the annoyances experienced on cyclecars are the continual stoppages caused by the belts coming off the back rims when going round a corner. I remember tracing the cause once to the belt pulleys not being in a straight line. Nothing appeared to have shifted, and a simple remedy had to be found without undertaking structural alterations. This was effected by fixing two plain pieces of rectangular steel, one on either side, to the distance rods. These guides were fitted so that their extremities were close to where the belt meets the back rim, and on the body side, as the belt cannot come off on the wheel side.



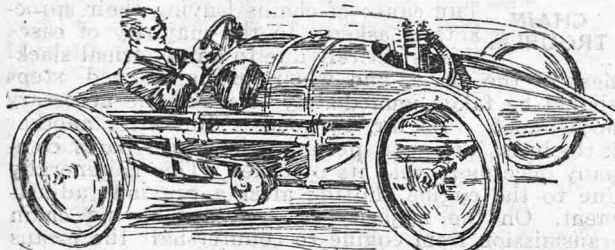
Guards to prevent the chain and belt from slipping off sprockets and pulleys respectively (see above).



A simple skeleton two-seater.

THERE has never been a movement which offers such scope for original ideas. So many thousands will be interested in a simple and economical motor vehicle, and its uses are so varied, that there will be a demand for a great number of different types of machines not as yet designed.

Upon what lines will the cyclecar develop? What interesting types will be evolved? There are wonderful opportunities for developing ideas, giving imagination free rein, unfettered by convention, as befits a movement still in its infancy.

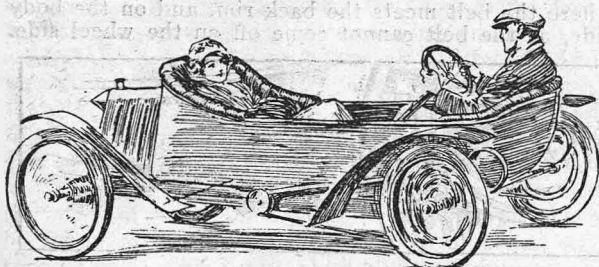


A possible Brooklands type.

Some possibilities are illustrated. We have the skeleton racing type on which the Brooklands enthusiast can soar to fancy figures in efforts to equal big car records on four wheels instead of two. At the opposite extreme, there is scope for the development of the family cyclecar. In the Brooklands type a simple skeleton cyclecar is illustrated. It will be noticed that the engine is exceptionally well placed for cooling purposes, and this idea is also carried out in the single-seated racer, out of the pointed bonnet of which the top of the cylinder head projects.

Another simple single-seater embodies a point in Mr. Harold Dew's ideas, viz., the chair back. Surely this machine, which has an ash frame, could be constructed very cheaply!

For the purpose of constructing light bodies it would be difficult to find any better material than wicker work. Everybody knows that the lightest type of sidecar is a basket pattern, and we think

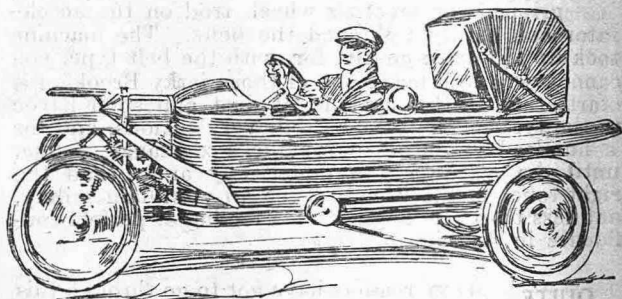


The unsociableness of the tandem-type overcome.

..... **LINES OF**
Striking Possibilities in the Evolution
the Movement Progresses. There is G

that the sociable cyclecar depicted in the accompanying sketch is quite practicable. A good feature is the storm apron.

The boat-shaped body three-seater is a novel type suggested by a sketch, which at first glance looks

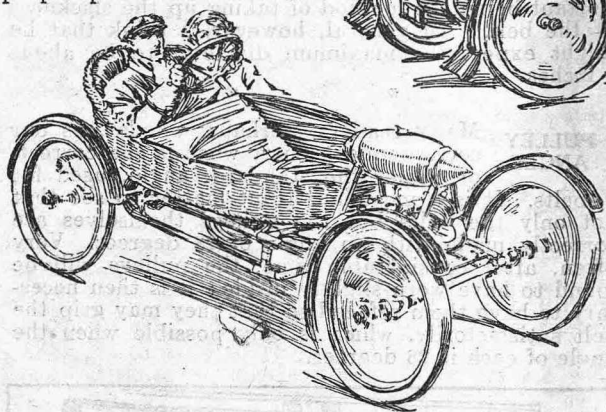


The perambulator hood idea.

like a Morgan Runabout on four wheels. The driver occupies a single seat in front and the passengers two seats behind. Why not?

We have the tandem seater. Why not go a step further and include an additional seat, the driver being placed between the two passengers. One of our staff has a Sabella cyclecar with so roomy a body, which is of the tandem-seated type, that an additional seat could be most easily interposed. It is a long, rakish-looking machine, but it holds the road and travels uncommonly well.

Those desiring the very simplest type of cyclecar, built on motorcycle lines, may be at a loss to secure proper protection from the



A wicker-body sociable.

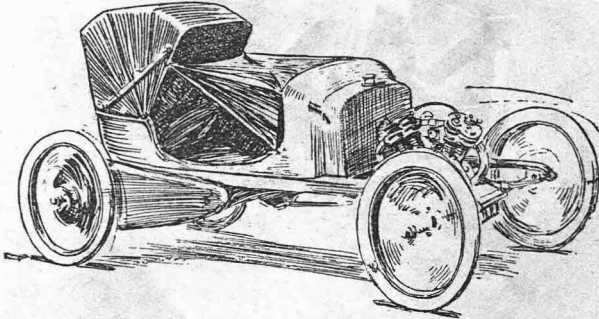
weather on this type of machine. What of the example of the motorbus driver? From a plain dashboard a heavy waterproof storm apron could be extended, secured by spring buttons to the driver's seat, and with a rubber-sleeved opening to go over the head and fasten round the neck of the driver.

DEVELOPMENT.

Cyclecar, some of which will be seen as for Really Good and Practicable Ideas.

Though it rain in torrents, all beneath the apron would be dry and comfortable.

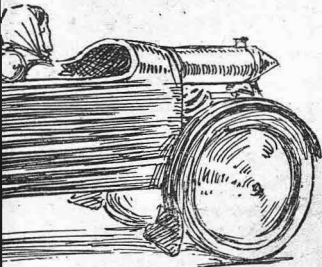
One of the drawbacks of the tandem type of machine is its alleged unsociableness. This is an idea that we do not endorse, and we have received



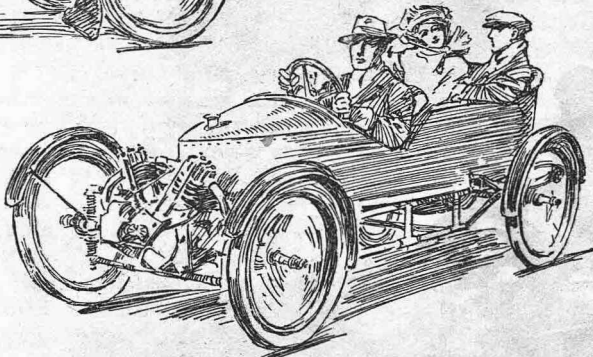
The hood idea—another method.

quite a number of letters from owners of the Bedelia type of cyclecar who find no defect in this respect owing to tandem seating. Still, those who think the tandem type of cyclecar is an unsociable machine, can try the plan of turning the front seat round, so that the passenger faces the driver. We have illustrated the idea, providing a comfortable position with a raised dash, to protect the passenger's head somewhat from the wind.

The Cape cart hood is not simple enough for cyclecar requirements. We must go back to the baby's perambulator, and here surely we shall find a type of hood absolutely ideal for cyclecar purposes, and which, when not wanted, might have a flexible transparent celluloid flap to be fastened up with spring buttons under the top of the hood, from which it is suspended. A further refinement is an apron stretched on light metal stays, which can be folded back when getting out of the car. How the hood looks and the celluloid screen can be seen in the suggestion for a tandem

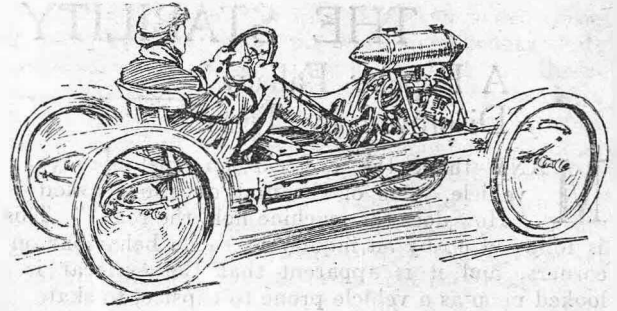


pt?



Another idea for a three-seater.

loid flap to be fastened up with spring buttons under the top of the hood, from which it is suspended. A further refinement is an apron stretched on light metal stays, which can be folded back when getting out of the car. How the hood looks and the celluloid screen can be seen in the suggestion for a tandem

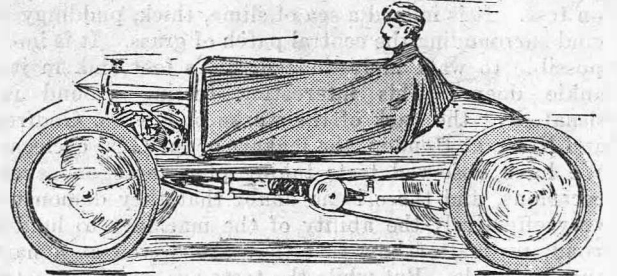


The simplest single-seater.

cyclecar, in which the driver braves the elements, while the passenger reclines in comfort behind him.

The methods of the chassis tester suggest a very novel type of body, the outstanding feature of which is the long, flat boards in place of the usual curved metal mudguards. The body might be constructed of match-boarding, braced at either end by a tubular framework supported on the main chassis. It is crude, but we have seen some worse ideas evolved by the amateur designer.

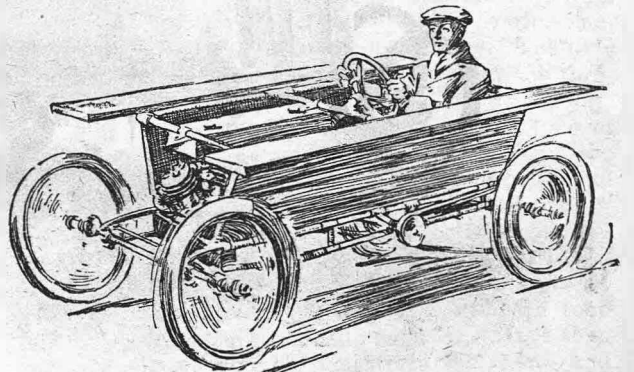
The foregoing will be sufficient to indicate what



The apron and cape combination.

varied types of design can be evolved. We have not touched finality by any means. Some ideas may look very bizarre, but the public would soon get accustomed to them, and those that are really practicable would become popular. The Bedelia, when it was first introduced, was of very novel appearance, and excited some ridicule. Now it is being widely copied. Other equally original types will appear in due course.

Probably the greatest scope for originality lies in the design of the four-wheeled single-seater, for which we believe there will be an enormous vogue. Next week we shall deal exhaustively with its possibilities. As an auxiliary to the big car, many new other types are feasible.



A body of matchboarding and planks.

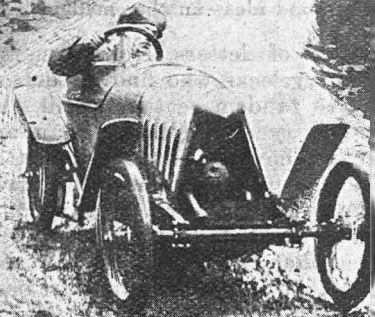
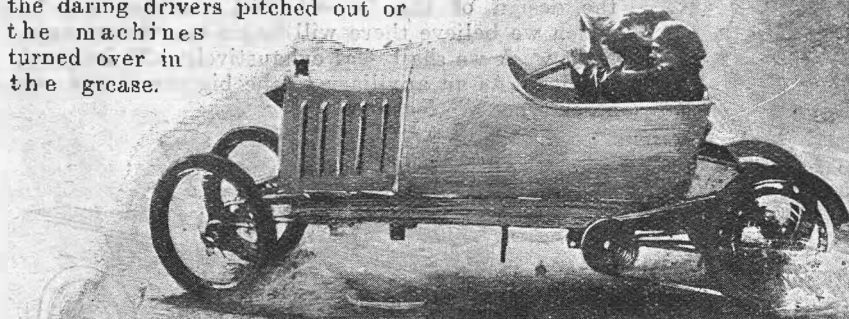
THE STABILITY OF CYCLECARS.

A Popular Fallacy Disproved by Tests.

MANY think the cyclecar an unstable type of vehicle. One of the first questions asked is: "How does the machine hold the road?" This is followed up by an inquiry as to its behaviour on corners, and it is apparent that the cyclecar is looked upon as a vehicle prone to capsize, to skate over the road or to roll from side to side at speed. The rakish-looking, low-built, tandem-seated cyclecar in particular has been regarded with suspicion, but time has shown that its tendency to overturn on corners is no greater than that of any car if not properly driven, and that it does hold the road.

It is not generally known that one at least of the cyclecar makers has a small but quite practical testing track. Imagine a circular path, less than 60 ft. in diameter. The centre is still green, but the track proper has long since been bereft of grass by the churning wheels of cyclecar chassis out on test. It is indeed a sea of slime, thick, puddingy mud surrounding the central patch of grass. It is impossible to walk in it—indeed, one's feet sink in it ankle deep. This interesting testing ground is situated at the back of the works of Messrs. Godfrey and Nash, at Hendon, the makers of the G.N. cyclecar. We have observed tests taking place here on several occasions, and there is no doubt that they demonstrate very effectively the ability of the machines to hold the road, no matter how fast they are driven at a narrow, turning angle. But while the tests are on, the spectacle is certainly very exciting for the spectator.

There is a roar in the distance, which gradually grows louder. Several cyclecars make their appearance through the narrow yard gate, and approach the slimy circle at speed. Six lengths separate them as they take to the muddy track. The power of the engine is not switched off, and the machines begin to slither here and there as they make their way round the treacherous course. Visitors unaccustomed to the scene stand appalled, momentarily expecting to see the daring drivers pitched out or the machines turned over in the grease.



Round and round the greasy track fear the little four-wheelers.

THE STABILITY OF CYCLECARS (contd.).

They wait for the smash, but it never comes. Round and round the greasy track tear the little four-wheelers. The testers, who are accustomed to giving this form of entertainment, are afraid of nothing, however, though the passengers have to hold on to the bodywork to keep their seats. The back wheels are skidding, racing and spinning. The machine rocks hither and thither in the grease, but in spite of the great strains to which it is subjected during the test there is not the slightest tendency to overturn. True, the front and back wheels are strained almost to buckling pitch by the manner in which the steering is kept fully locked over, but in spite of this treatment the cyclecars stand up to their work, and after half-a-dozen circuits "all out" retire through the yard gate in as roadworthy a condition as they entered the track a few minutes before. "Wonderful!" exclaim the spectators, fully convinced that it is just as difficult to turn over on a properly-designed cyclecar as it is on a properly-designed car.

And why not? Because on a cyclecar, although the machine is so light, the centre of gravity is kept very low, and this helps to secure the stability of the vehicle. Not only are the engine and gears placed low in the frame, but the weight of the passengers is also well distributed and near the ground. Top-heaviness is the thing to be guarded against in building a light four-wheeler. In this connection it may be interesting to note that a certain cyclecar manufacturer recently constructed a racing monocar for competition work at Brooklands. Its preliminary trials revealed the fact that although it was perfectly steady at over 50 m.p.h. on the track and could be steered with ease at this speed, one of the front wheels lifted a few inches when turning into the straight from the track under the members bridge somewhat too rapidly. The reason for this was afterwards found to be that the engine was carried too high in the frame, and as a result of this experience it will be placed some inches lower on the 1913 machines.

The three-wheeled cyclecar with single driving wheel is certainly inclined to "wag its tail" on greasy roads, a drawback overcome by fitting a good non-skid tyre, and by careful driving. We are told—and hope to put this to the test—that the Stepany "road-grip" cover, introduced about a year ago, overcomes all tendency to skid on the part of three-wheelers. The pattern of the tread is a series of oval lobenges, placed cross-ways. We have found other rubber-studded covers grip the road very effectively. The chief requirement, however, is careful driving.

Almost any vehicle will skid if braked violently on greasy tramlines. The front wheels and countershaft combination of brakes seems the best for three-wheelers, as it is undesirable to have too powerful a brake on the single driving wheel. The best proof of their reliability is the very large number in use as parcelcars. We have driven both the A.C. sociable, which has been before the public longer than any other type of cyclecar, and the Morgan three-wheeler at their top speeds, in traffic, and round right-angled corners, and have demonstrated that the tendency to

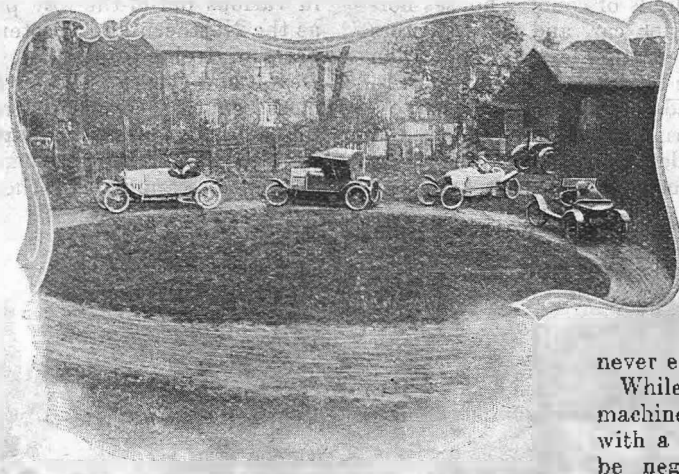
skid is slight, while there is absolutely no propensity to turn over. Indeed, the Morgan has lapped at over 62 m.p.h. at Brooklands, so that it is obvious that it is as stable as any car. Quite recently we drove a single-seated Morgan, shod with plain tyres, over very greasy roads, and yet never experienced a skid.

While care is desirable until the machine is fully understood, as with a powerful car, corners can be negotiated on any type of cyclecar with safety. One can corner as fast on a well-made cyclecar as on a car or motor-

bicycle. Indeed, we know of one particular make of machine that will hold its own with a 60 h.p. car on give-and-take and winding roads. It is safer to drive, quicker to pick up, and altogether more manageable than the big car. The absence of a differential gear on those machines employing double-belt drive to the back axle is no preventive of fast corner work. On the G.N. and Bedelia, which are of this type, cornering at speed is perfectly safe. If the bend be taken too fast the rear wheels simply skid sideways, just as they would if a car driver took the bend too fast. We have never felt it advisable to lean in on a corner, though those who have been accustomed to driving sidecars may be able to obtain still better results with cyclecars by adopting this practice. If one were cornering at very high speed—as, for instance, in the proposed standard road race for cyclecars—it might be advisable for the mechanic to hang out on the footboard, as they do in the big Continental races. But under ordinary touring conditions such tactics are quite unnecessary. The only occasion on which any care is necessary is when turning very abrupt hairpin bends banked the wrong way.

It may be thought that the long, narrow type of cyclecar is more unstable on the road than the sociable kind. In our road tests we have not found this to be the case. The tandem-seated model, though considerably faster than its sociable competitor, is equally well balanced on the road, whilst its narrowness allows it to be driven through tight places.

It is certainly to be hoped that a standard road race for cyclecars will be held next year. More than anything else it would demonstrate the safety and stability of the miniature car.



Several cyclecars appear and make for the slimy circle at speed. A view of the G.N. track.

THE CYCLECAR AS AN AUXILIARY.

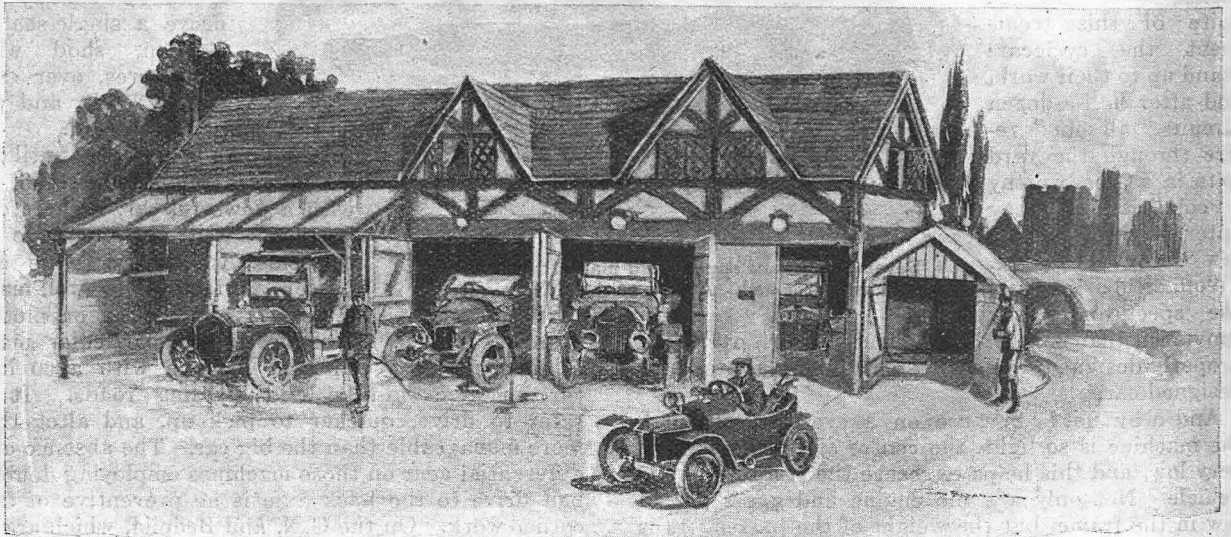
A Handy Vehicle for Minor Uses where the Big Car is Not Required.

THE wealthy automobilist who keeps several cars will find nothing new in the idea of vehicles for auxiliary uses. Men who rent lodges in the Highlands regard it as an absolute necessity to have an estate car, which is convertible to a cart for luggage collection, to a beaters' car, to a wagonette for the conveyance of friends who are invited to the "shoot," etc., etc. Hundreds of country houses normally find work for a station car, and many doctors themselves turn out in a smaller car at night than the one which they favour by day. It is, however, to the cyclecar that thousands of existing and prospective car owners must turn for the inexpensive and real satisfaction of their desires in this direction.

The arrival of the cyclecar in numerous approved

parable to the conveyance of a postage stamp by an elephant.

That is one side of the question only. To whatever extent openings may be recognized for cyclecars where a motor-house and a motorcar are already possessed, the new ground to be broken is in ratio probably as 10 to 1. People who have visited and driven in various out-of-the-way parts of the country, such as the Northern and Western Highlands, and certain parts of Ireland and Wales, and of the counties of Devon and Cornwall, know full well that some of the most beautiful scenery is traversed only by roads of the most execrable description. The roads, if the winding and tortuous tracks can properly have that appellation applied to them, are too narrow and



Just for running down to the golf links—why take a big car?

models and types, which stage may fairly be stated to have been reached at the date of writing, brings within range of practical politics the opportunity to add to the contents of the motor-house in such a fashion that the utmost economies, coupled with adequate and suitable service, shall be attained.

For Minor Uses.

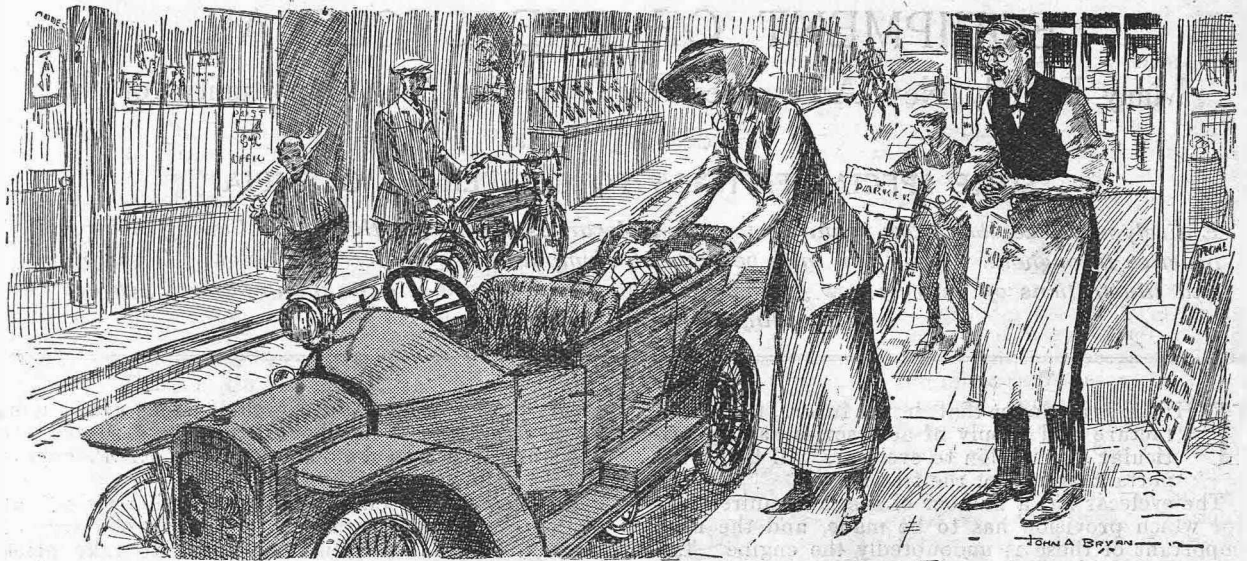
How many people who own cars overlook the fact that they frequently use a big vehicle for minor trips and duties, and so involve themselves in unnecessary expense? Again, how many present-day motorists shirk the purchase of a second car, partly on the score of lack of space and partly on the score of lack of means, and forget to inquire further into the capabilities of the cyclecar? There are, indeed, huge numbers to whom these inquiries are apposite. Our desire is to awaken them to the facts of the situation as it now is. They represent a considerable section of the public to whom the cyclecar must appeal, though by no means the largest. It is high time that they stopped using ordinary motorcars for all their work, and, in some cases, in ways which are possibly com-

otherwise dangerous for an ordinary motorcar to be taken along them. There is often not enough clearance for two vehicles to pass one another, and the turnings are frequently so acute that only the nippiest car with the shortest of wheelbases can get round them. Whilst an average motorcar can safely be taken part of the way, it would certainly be much better to go all the way in a cyclecar, and so be able to ensure completion of the journey on wheels.

The Professional Man.

For the same reasons, the case of the country doctor should immediately appeal to all who look into the subject, for he has often to leave his car on the high road, in order to save it from excessive wear and tear, the while he trudges along some track or path over which it would not be safe to drive in the ordinary way. It is partly for visits of this kind that the cyclecar will come into widespread use in the medical profession, in country districts more particularly.

In cities and towns, the cyclecar, by reason of its low first cost and low annual maintenance, will also



HANDY ALSO FOR PARCEL CARRYING.

The auxiliary uses of the cyclecar must include its suitability for shopping expeditions, especially in country districts. A lady would have no difficulty in handling the machine.

appeal to scores of practitioners who now use bicycles or public conveyances: the cyclecar will cost but little more per annum, and the buyer will be able to keep himself thoroughly clean and presentable while using it—a state of affairs which is not achieved by a man who uses a bicycle or does any walking.

Another branch of auxiliary use for the cyclecar will be found in the great world of commercial travelling. All "knights of the road" do not carry huge sample cases; numbers of them are able to travel light. Many of these trade representatives are at the moment denied the use of a motorcar by their principals, and probably with every justification. But they

cannot be denied that auxiliary for much longer, with the advent of the successful cyclecar. Facts and references will be too strong, and the means to visit customers in awkward places, as well as to pay more calls per day in our cities, will be accepted by those firms who wish to keep themselves in the front rank, and who are wise enough to move before their competitors.

The bugbear of cost has disappeared: the cyclecar, for its total running and maintenance, will often cost less than only the pneumatic tyres of a larger and more powerful motorcar. That is a consideration of fundamental importance. E.S.S.-S.

ENGINE DESIGN.

A Two-stroke Motor-cycle Engine which Gets Rid of the Burnt Gases Before Taking a Fresh Charge, and is Very Suitable for Cyclecar Practice.

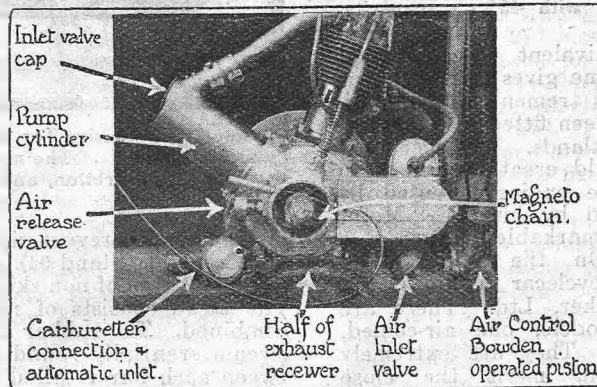
ALTHOUGH the most caustic critic cannot find fault with the efficiency and reliability of the modern engine, nothing like finality has been achieved in design, which, it is quite possible, will undergo radical alterations. Increasing attention is being devoted to water-cooling, while several new two-stroke motors have recently made their appearance. The simplicity of the two-stroke engine is to a great extent counter-balanced by its comparative lack of efficiency, due to the difficulty of getting a full charge into the cylinder, and the burnt gases out, the cycle of operations being so rapid.

These difficulties are claimed to have been overcome in the latest type of two-stroke engine, described in the current issue

of "Motor Cycling." The great feature of this engine is the arrangement made for scavenging the cylinder thoroughly of the burnt gases before the entrance of the new charge. This important end is secured by the

use of an air compressor mounted on the crankcase and operated by the crank. This compressor is connected to the firing cylinder by a transfer pipe, and supplies a blast of pure air before the charge is introduced. The pump piston works 120 degrees in front of the main piston. A mechanically-operated valve is used to control the admission of the air and gas into the cylinder, while the exhaust port is uncovered by the piston at the proper amount.

The Low forced induction engine is also described in "Motor Cycling."



Reproduced from "Motor Cycling."

A remarkable two-stroke engine described on this page.

EQUIPMENT OF THE CYCLECAR.

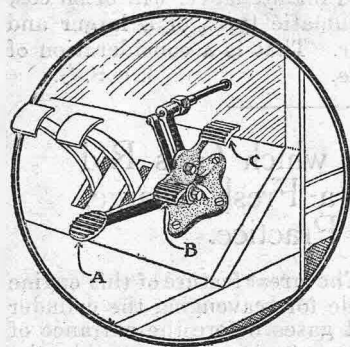
Many Entirely New Accessories Required—A Great Opportunity for the Accessory Trade.

SOME SPECIAL FITTINGS TO BE SEEN AT OLYMPIA.

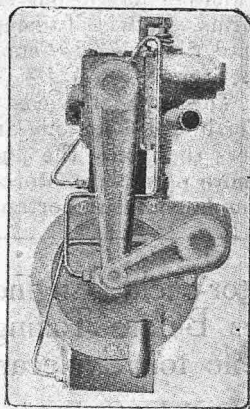
Entirely new accessories are required for the cyclecar, especially for the type following motorcycle practice throughout. Some few may be seen at Olympia and are referred to below. Descriptions and illustrations of entirely new fittings as they are produced will be an important feature of succeeding issues of "The Cyclecar."

THERE is no doubt that, in the future, the manufacture and supply of accessories having particular application to cyclecars will be an important branch of the trade.

The cyclecar has a number of special requirements for which provision has to be made, and the most important of these is undoubtedly the engine. The great novelty in design is the Low forced-induction engine. The petrol gun has been a project of science for many years, and the wonderful Low engine, the first-published authentic illustrated description of which appears in this week's "Motor Cycling," is based on the principle that scientists have been studying. Instead of being sucked in, the petrol mixture is pumped under pressure into the combustion chamber. There is thus a far greater quantity of petrol gas under very much higher pressure in the cylinder than in one of the ordinary type of the same size. The explosive effect is terrific, and instead of



The novel B.C.B. accelerator referred to on the next page.



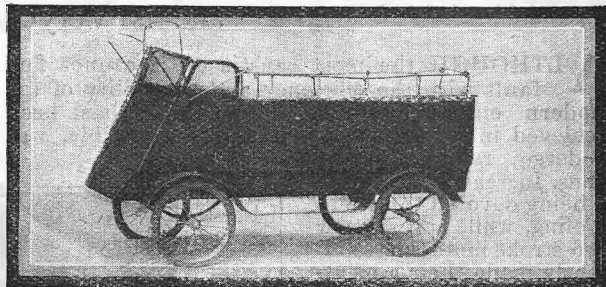
The greatest innovation in engine design—the Low forced-induction engine giving 15 h.p. with 499 c.c. capacity.

3½ h.p., which is the equivalent of a cubical capacity of 499 c.c., the engine gives 15 h.p.! For cyclecar work the engine has tremendous possibilities—indeed, it has already been fitted into a cyclecar frame and tried at Brooklands. The speed obtained in private tests would create a sensation could it be mentioned. The engine invented by Dr. A. M. Low is described by him in "Motor Cycling," forming a most remarkable feature of a very remarkable issue. On the same stand (198) the new Precision cyclecar engines are shown by Messrs. F. E. Baker, Ltd. There are two 8 h.p. twin-cylinder models, one air-cooled, and the other water-cooled. They are extremely sturdy in construction, and merit the close inspection of all cyclecar builders. Messrs. Motosacoche, Ltd., on Stand 102, are showing a 750 c.c. twin-cylinder air-cooled engine which is claimed to give

a very high power output, its dimensions are 74 mm. by 80 mm., and it has been carefully designed for the work it has to do. The 90° twin J.A.P. engine should also attract attention.

A twin-cylinder engine with the cylinders set at 90 degrees to one another calls for a special type of magneto which will cause the spark to take place in the combustion chamber at the right period and also when the armature is cutting the maximum lines of force in its field. Such a magneto has been marketed by the Bosch Magneto Co., Ltd. (Stand 254), and it should be largely used on cyclecars, as a number of makers fit 90-degree twins to their machines. The magneto is called the H.D.2 type, and differs in external appearance from the ordinary twin magneto by the fact that the high-tension terminals are set at right angles to each other instead of opposite.

Tyres are probably the next most important accessory for cyclecar work. Among the large tyre companies who are particularly catering for the wants of cyclecarists, is the Palmer Tyre, Ltd. (Stand 136). They are showing samples of the Palmer cord cyclecar tyre, a 26 in. by 3 in. tyre manufactured on the same principle as the cord motor tyre in both the well-known three-ribbed tread and also with the metal-straddled tread. These tyres are claimed to give great reliability and low cost per mile. Another cyclecar tyre is shown by the Kempshall Tyre Co. (Stand 134). There are two special cyclecar tyres of Kempshall make, one a 650 mm. by 65 mm., the other a 26 in. by 3 in., both being provided with



A novel body design for commercial use with space for samples or goods. The model is designed by Mr. G. W. Rice, of Surbiton, and can be seen at Olympia.

inside flaps to prevent nipping. The Avon India Rubber Co., Ltd. (Stand 94), are exhibiting a new combination pattern of non-skid cyclecar tyre, in four sizes. The tread consists of rubber bars and steel studs combined. The rubber bars are placed in three rows circumferentially round the tread, and the gap between each bar is filled by a steel stud. The sizes are 630 mm. and 700 mm. by 65 mm., and 650 mm. and 700 mm. by 75 mm. A tyre which should have a long life on the road is shown by the Rom Tyre and

CYCLECAR ACCESSORIES (contd.).

Rubber Co. (Stand 1). The tread is plain and of a square section, the thickest portion of the tread measuring nearly half an inch in addition to four layers of canvas. The Duniop Rubber Tyre Co., Ltd. (Stand 116), although making no special tyre for cyclecar use, in their Pillion tyre market a cover which is entirely suitable. The North British Rubber Co., Ltd. (Stand 48), are manufacturing a special cyclecar tyre in three patterns, having respectively a plain-ribbed, a grooved, and a three-ribbed tread. This last is heavily built, and is stated to be extremely suitable for very hard driving and rough roads. The John Bull Cross-Groove tyre, made by the Leicester Rubber Co. (Stand 137), should particularly appeal to users of cyclecars. The tread is composed of rubber, which is hydraulically compressed, during vulcanization, to over 1200 lb. per square inch. Another company marketing tyres suitable for cyclecars is the Severn Rubber Co., Ltd. (Stand 211), who are showing grooved and rubber studded covers, 650 mm. by 65 mm., which are made on car lines, having a heavy tread on a good strong casing. Among those who manufacture tyres for high-powered motor-bicycles, which might be suitable for very light cyclecars, are W. and A. Bates, Ltd. (Stand 70), the Continental Tyre and Rubber Co., Ltd. (Stand 8), Etablissements Hutchinson (Stand 135), and J. Pedley and Son, Ltd. (Stand 130). The Michelin Tyre Co., Ltd. (Stand 10), market special voiturette or light-car tyres, suitable for use on cyclecars, which fit the ordinary 65 mm. car rim, and not the motorcycle variety.

Belts.

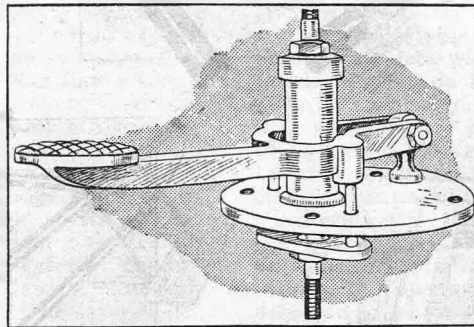
The subject of belts is an interesting one to cyclecarists, and one of the most popular fitted is that sold by the Service Co., Ltd. (Stand 224). This belt is made of leather, and is sold in three grades, at varying prices. The fastener provided with this belt is simple, and is very satisfactory in practice. The Whittle Link-grip Belt is shown on the same stand. It is particularly suitable for cyclecars, and a great feature is the quick method of shortening possible.

There are a number of rubber and canvas belts which are suitable for use on cyclecars where the change of gear is not by variable pulleys. The Dunlop belt, shown on Stand 116, has given general satisfaction for motor-bicycle work, and should give good service when used as the final transmission in cyclecars. The new Flexis belt, on Stand 48 of the North British Rubber Co., Ltd., is extremely supple, and the fact that it is introduced by this company should be sufficient evidence of its worth. The Max Chrome leather belting is shown on Stand 244, of Max Steiner. It is manufactured of three plies of chrome leather, stitched together with two rows of copper stitches, and it is made in various sizes up to 1½ in., which is the largest size that is in use.

The Leicester Rubber Co. (Stand 137) are exhibiting the John Bull hexagon rubber belt. The section of this belt resembles a hexagon with unequal sides, and this shape is claimed to improve the pulling capacity of the belt, as there is a greater surface of the belt in contact with the pulley.

Another accessory of great importance on cyclecars is the carburetter. The general demand is for automatic or single-lever carburetters, and one of

the first makers to recognize this demand were Messrs. Lukin, Ltd. (Stand 234). In this interesting instrument the proportion of air to gas is maintained mechanically by the rotation of the throttle, there being no springs or dashports to furnish the possibilities, if not the probabilities, of trouble. When the throttle lever is in its extreme negative position, pure air alone is drawn into the engine, and an effective brake is thereby provided, the engine being cooled at the same time. The Senspray carburetter shown by Messrs. Charles H. Pugh, Ltd. (Stand 201) adopts the principle of the scent-spray; it is of the two-lever type, but control is practically effected entirely by the throttle, the air lever being



The Amac accelerator controlled by hand or foot. It is shown on Stand 199.

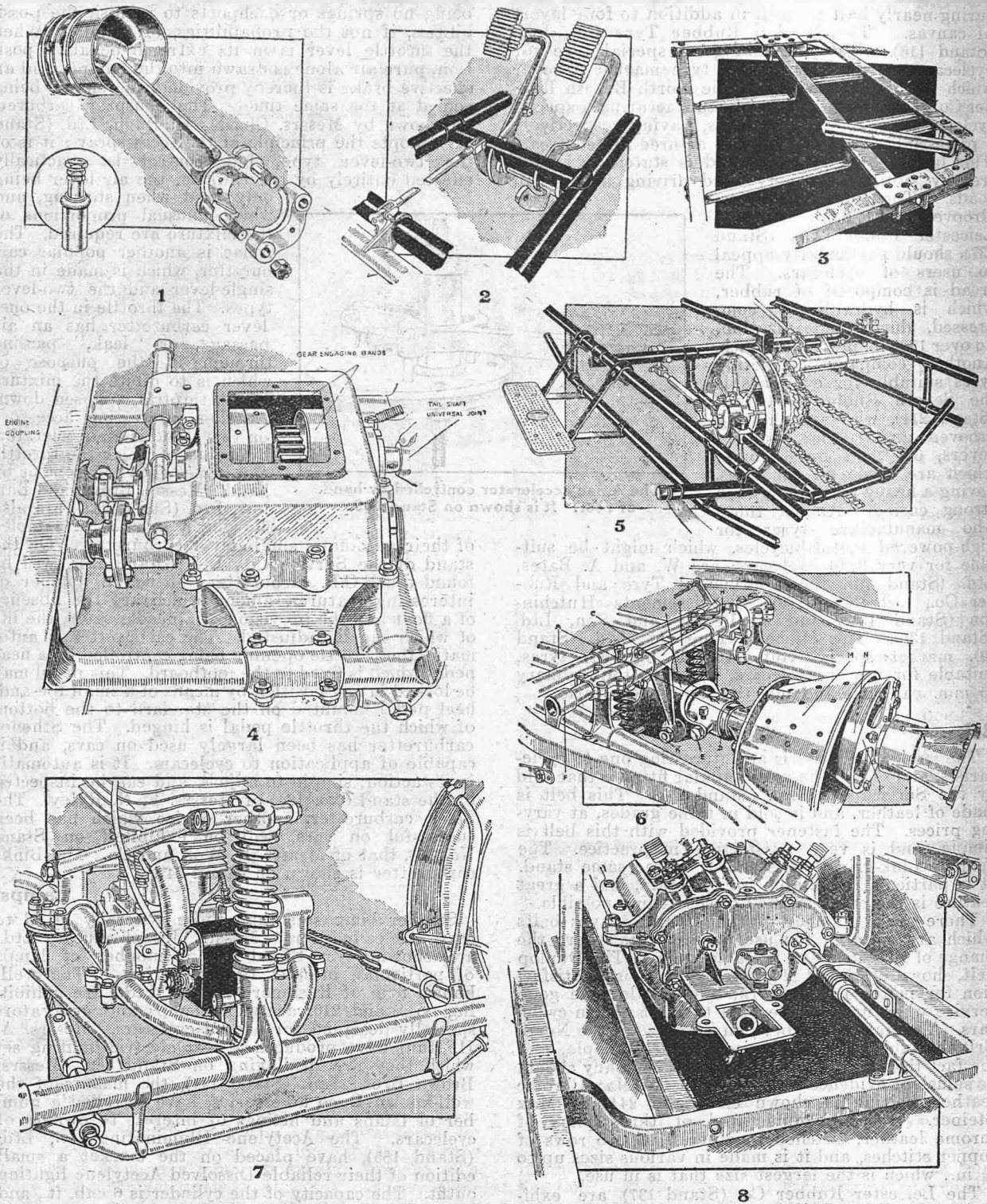
only used when starting, and when unusual proportions of the mixture are required. The Amac is another popular carburetter, which is made in the single-lever and the two-lever types. The throttle in the one-lever carburetter has an air passage, or "leak," passing through it, the purpose of which is to dilute the mixture as the throttle is closed down. Another interesting accessory on this stand is an accelerator, by means of which the throttle can be set either by foot or by hand. Messrs. Brown and Barlow, Ltd. (Stand 253), are also showing a number of samples

of their automatic single-lever carburetter. On the stand of the Service Co., Ltd. (Stand 224), will be found the B.C.B. carburetter; it has a number of interesting features, among which are the absence of a float and the provision of a needle valve, the lift of which can be adjusted. The carburetter is automatic, the throttle opening being controlled by a neat pedal which is fixed to the footboard. This pedal may be locked in any position by means of a small toe-and-heel pedal mounted on the standard to the bottom of which the throttle pedal is hinged. The Sthenos carburetter has been largely used on cars, and is capable of application to cyclecars. It is automatic in its action, simple to adjust, and can be inspected on the stand (No. 164) of Messrs. F. N. Ryley. The Solex carburetter, another device which has been successful on cars, will be exhibited on Stand No. 343, that of Messrs. S. Wolf and Co. The Binks carburetter is shown on Stand 247.

Lamps.

Smaller lamp sets than those generally fitted to cars are called for. Messrs. Joseph Lucas, Ltd., are showing on Stand 174 a number of lamps of particular interest to cyclecarists. The well-known firm of Rushmore Lamps, Ltd., are exhibiting on Stand 210, acetylene lamps and generators specially designed for use on cyclecars. Messrs. A. H. Hunt have produced a neat electric lighting set which they are displaying on Stand 162. Messrs. Brown Bros., Ltd. (Stand 144), the makers of the well-known Duco accessories, have included a number of lamps and fittings of interest to owners of cyclecars. The Acetylene Illuminating Co., Ltd. (Stand 185), have placed on the market a small edition of their reliable Dissolved Acetylene lighting outfit. The capacity of the cylinder is 6 cub. ft., and its weight is about 6 lb., so for a small increase in weight over that of the ordinary generator, a clean steady light is obtained without trouble or discomfort. Messrs. Samuel Hall and Sons, makers of the well-known F.R.S. lamps, have placed before users of the cyclecar the choice of two special sets of lamps, either acetylene or electric, the latter being of egg-shaped design and consisting of five lamps in all.

NOVEL MECHANICAL FEATURES ON 1913 CYCLECARS.



1.—The Perry connecting rod and piston (inset, one of the adjustable tappets and housing). 2.—New Hudson pedal control to clutch and rear brake. Note the trigger to clutch lever for holding out the clutch. 3.—Front end of frame of the Kendal, showing the engine and gearbox mountings and the steering column carrier. 4.—The Kendal gearbox. 5.—New Hudson. Note step and handle-starting device. 6.—The Media gear-changing mechanism. 7.—The Rollo single-seater. Note the double cable steering with spring boxes. 8.—The Tyseley, showing front of frame, engine mounting and timing cover, magneto bracket, oil pump, and starting-handle mountings.

CYCLECAR FEATURES AT OLYMPIA.

New Cyclecars—The Rudge, the Air-cooled Eric, the New Model Alldays, the Media, and the Wilton. Special Cyclecar Accessories.

Details of the very newest Cyclecars, some of which have only arrived at Olympia as we go to Press, are described below.

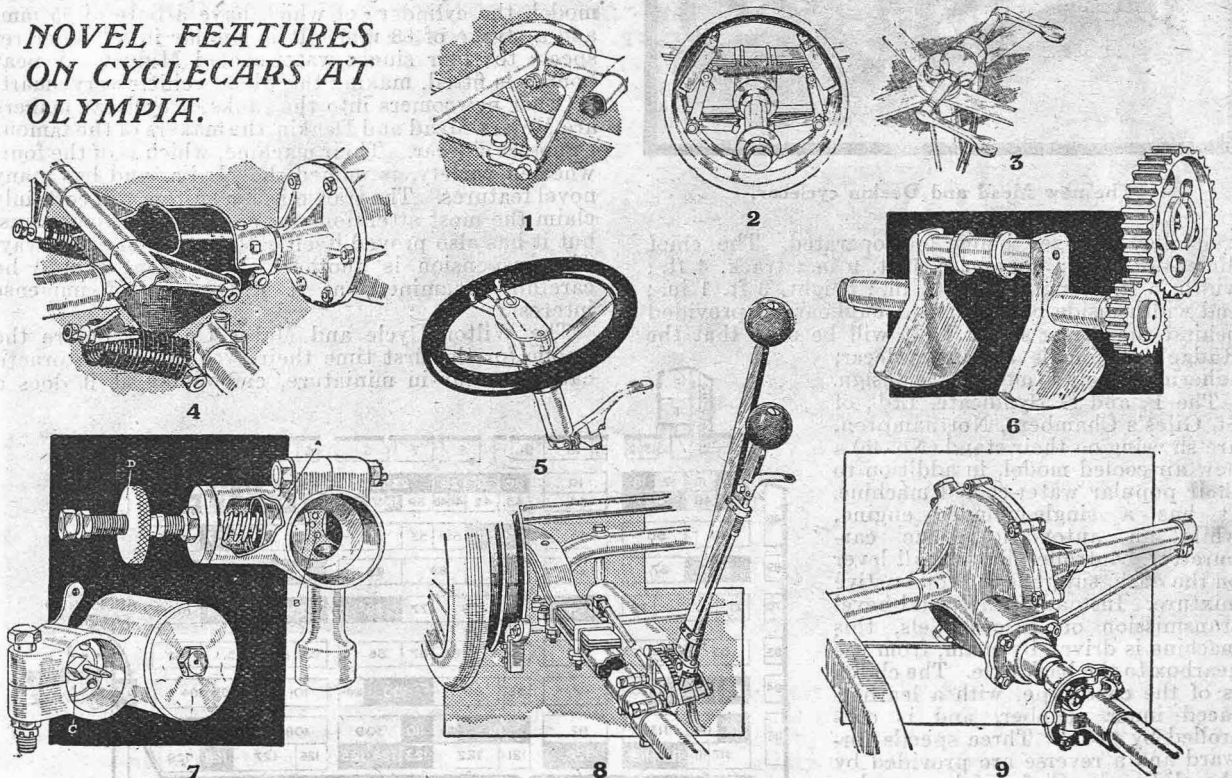
MOST people, when departing from Olympia, will have come to the conclusion that this year's Show is the show of novelties. It is true that all classes of vehicles on view help to give the visitor this impression, but the majority will admit that more novelties are to be found in the ranks of the cyclecars, and it is rightly so, for a new industry must launch forth with new ideas. A casual glance round the stands will reveal to the visitor many machines and accessories which have not been previously placed on the market, a few of which are now described in brief.

The machine that has aroused a large amount of interest is the Rudge cyclecar, which, in its present form, differs slightly from that previously described. The main features are a large single-cylinder engine, single belt drive over expanding pulleys to clutch on countershaft, and thence to the back wheels by belts. The engine is air-cooled, and, having a bore of 85 mm. and a stroke of 132 mm., its capacity is 750 c.c. The valves are superimposed, according to the usual Rudge practice, and the flywheels have been specially designed to provide slow running and absence of vibration, while roller bearings are fitted to the connecting rod. The drive passes from a 6 in. expanding pulley on the engine shaft to a 10½ in. expanding pul-

ley on the countershaft, which also bears a multi-disc clutch containing 48 plates. The variation of gear between the engine and countershaft is effected in the same way as on the Rudge-Multi, one pulley opening out as the other closes up. The final drive from the adjustable pulleys on the end of the countershaft to the back wheels is by two ½ in. belts. Special provision is made for changing gear when the machine is stationary, which might be rendered necessary when the car has been stopped on a high gear. The clutch is disengaged and the gear lever is pulled back to lower the gear. This is possible, as the clutch is mounted on the countershaft. There is an auxiliary lever, which works normally in unison with the gear-change lever, but by depressing a thumb plunger this auxiliary lever may be operated separately, thus opening the engine pulley until the belt drops on to a bearing ring; at the same time the belt is loosened. The gear ratio ranges from 3-1 to 14-1.

Steering is effected by means of a pinion, meshing with teeth cut on the inner periphery of a quadrant, and the motion is transmitted directly to the steering wheels by a rod. These are splayed in order to provide easy steering, a point which is assisted by the wide track, namely 4 ft. Brakes operate on the belt

NOVEL FEATURES ON CYCLECARS AT OLYMPIA.



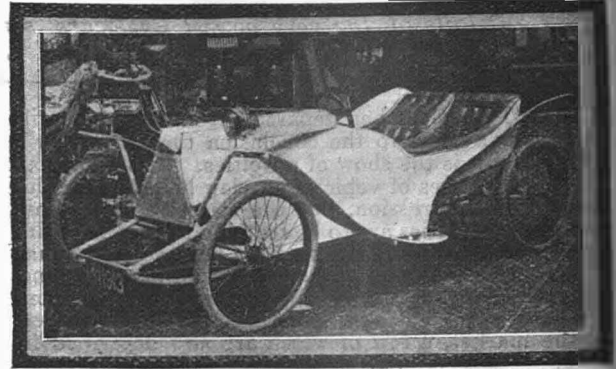
1.—Rudge steering gear. 2.—Leeds double brakes. 3.—Alldays controls. 4.—Gear-actuating mechanism on the Media. 5.—Rudge controls. 6.—Perry crankshaft and timing pinions. 7.—Perry carburetter. 8.—Rollo gear and brake levers. 9.—Tyseley back axle.

CYCLECAR FEATURES AT OLYMPIA (contd.).

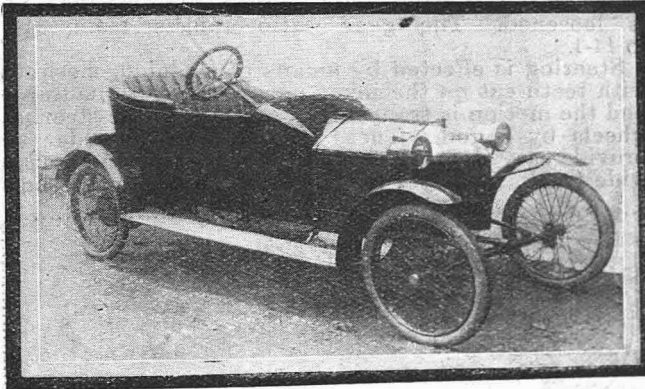
rims on the back wheel, being compensated and operated either by foot or hand. The Senspray carburetter control levers are neatly mounted on the top of the steering wheel, and at the side are the gear and brake levers. The left pedal operates the clutch, and the brake is applied by the right pedal. The body is of a special two-seater type, the seats being arranged with the driver's seat slightly ahead of that of the passenger; between the two is the guard for the belt from the engine to the clutch. The five-gallon petrol tank is mounted above the engine, being divided into two entirely separate compartments with a petrol tap to each, thus ensuring a sufficient head of petrol when ascending and descending hills.

The wheels, of extremely sturdy construction, carry 26 in. by 2½ in. Dunlop tyres. The frame is of special construction, forming at the same time the skeleton of the body. The chassis is underslung from semi-elliptic springs at the front, and is supported on quarter-elliptic springs at the back. The engine starter connects by a short chain to a pawl on the camshaft drive, in the same way as on the Rudge free engine motor-bicycle. It is operated by a handle between the off front wing and the chassis. The oil-tank is fitted in front of the footboard, the spring-

sired. The frame is of novel construction, its principal member consisting of a large-diameter central tube. It is the result of careful experiments to obtain absolute freedom from sideslip. The makers discovered that all the skidding trouble was caused by a



The new Rudge cyclecar.



The new Mead and Deakin cyclecar.

swaying motion of the chassis, which naturally throws the back wheel out of the vertical, and this specially-designed frame makes this movement impossible, with the desirable result that the machine always follows the steering wheels, even if the back wheel is locked. Springing on this model is effected by a single transverse semi-elliptical spring in front and two semi-elliptical springs at the rear. The whole chassis is well constructed, and the cyclecar complete sells at the low figure of £105.

Besides their Midget cyclecar and their three-wheeled parcelcar, Alldays and Onions, Ltd., Birmingham, are displaying a neat twin-cylinder air-cooled model, the cylinders of which have a bore of 85 mm. and a stroke of 89 mm. It is similar in all other respects to their single water-cooled Midget. A neat bonnet is fitted, making the whole vehicle very smart.

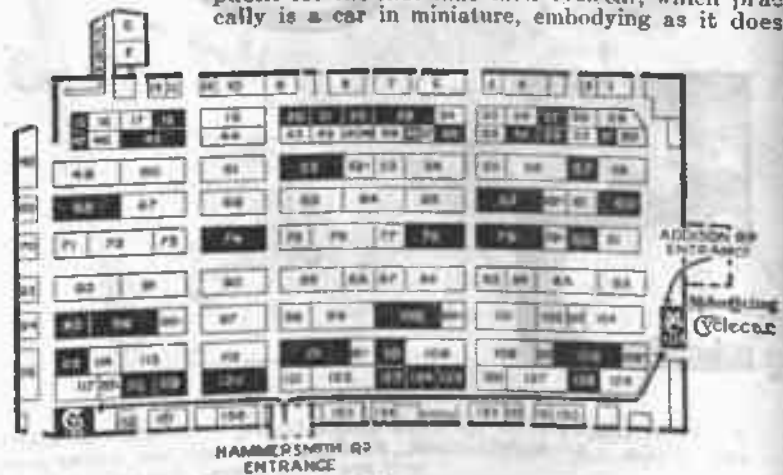
Other newcomers into the ranks of cyclecar makers are Messrs. Mead and Deakin, the makers of the famous Canoelet sidecar. Their machine, which is of the four-wheeled variety, is named the Media, and has many novel features. The transmission system will certainly claim the most attention, for not only is it ingenious, but it has also proved itself satisfactory in every way. The suspension is another feature that should be carefully examined, as it will prove of immense interest.

The Wilton Cycle and Motor Co. put before the public for the first time their cyclecar, which practically is a car in miniature, embodying as it does a

controlled plunger being foot-operated. The chief dimensions are: wheelbase, 6 ft. 9 in.; track, 4 ft.; width, 5 ft.; length, 9 ft. 1½ in.; height, 3 ft. 1 in.; and width inside body, 3 ft. A cupboard is provided behind the driver's seat. It will be seen that the

Rudge machine is a true cyclecar, adhering closely to motorcycle design.

The P. and C. Syndicate, Ltd., of St. Giles's Chambers, Northampton, are showing on their stand (No. 45) a new air-cooled model, in addition to their popular water-cooled machine. It has a single-cylinder engine, while an automatic Amac carburetter, controlled by a small lever on the dash, supplies the combustible mixture. Instead of the usual bevel transmission on Eric models, this machine is driven by chain, from the gearbox to the back axle. The clutch is of the cone type, with a leather-faced inner member, and is controlled by pedal. Three speeds forward and a reverse are provided by the sliding type of gearbox, and a pace greatly in excess of the legal limit can be attained by the machine with ease, while its hill-climbing capabilities leave nothing to be de-

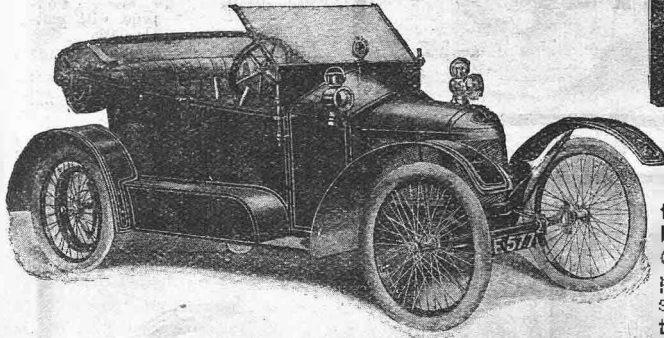


Plan of the main hall of Olympia. The cyclecar stands are blacked in.

CYCLECAR FEATURES AT OLYMPIA (contd.).

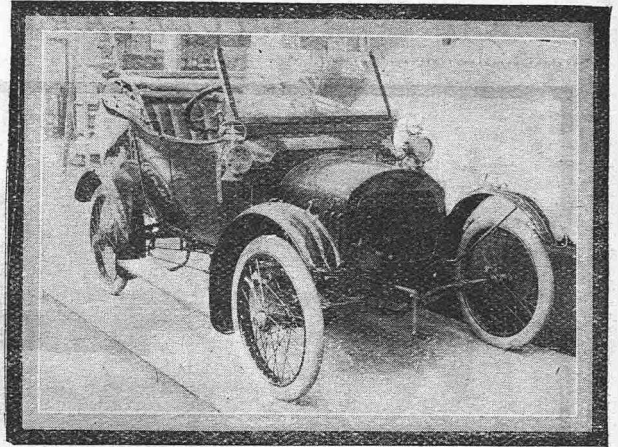
multiple-disc clutch, a three-speed and reverse gear-box, and a cardan shaft driving a differential back axle. An 8 h.p. air-cooled J.A.P. engine is fitted as standard, but a four-cylinder water-cooled one can be provided instead if preferred.

Among the stands in the gallery showing accessories especially made for cyclecars, Joseph Lucas, Ltd., may be mentioned. They are showing some very neatly designed acetylene headlights, made in various sizes and of heavy gauge material. For those cyclecarists who prefer electric lighting on their machines, an inspection of the small Broit lighting dynamo, which



The latest Duo model. Note the new step-board.

is shown on Brown Bros.' stand, will prove of interest. Considering the work an accessory of this sort has to do, the weight and size of this model are extremely small, which is a point which will appeal to all owners of cyclecars.



The new air-cooled Alldays cyclecar.

It will be seen from the foregoing remarks that all types of cyclecar are on view at Olympia. It would be difficult to find a more representative collection. On the one hand we have the single-seater Rollo priced at 70 guineas and the three-speed New Hudson sociable at 80 guineas, while at the other extreme there is the Singer at 185, or with coupé body 240 guineas. Though many people will say that such a development of the cyclecar is out of place in a motorcycle show, there are others, naturally including the Singer Co., who aver that the cyclecar will develop in three years time on the lines they are adopting now. Their reply to critics is "Wait and see." The burning question of the moment is that of three wheels or four.

AN ILLUSTRATION FROM "MOTOR CYCLING"—NOW THE ONLY PAPER SOLELY DEVOTED TO MOTOR-CYCLING. TUESDAYS, ONE PENNY.



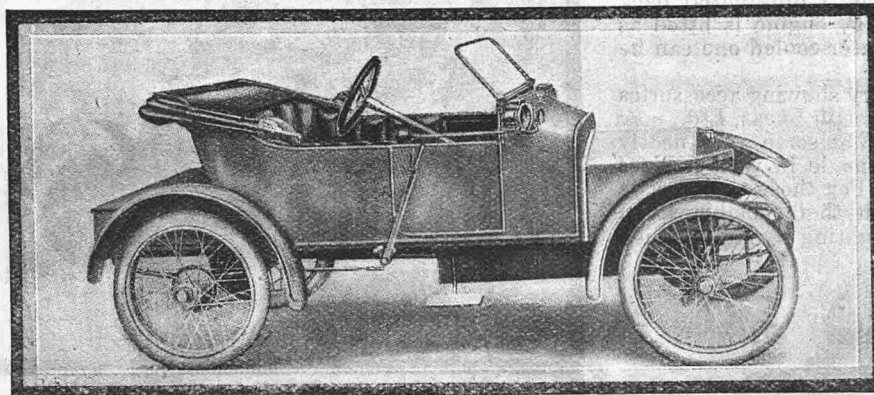
"MOTOR CYCLING" breaks record with this week's issue. It is produced on daily newspaper lines, with the first-published complete illustrated description of the Olympia Show. The Show report is classified and arranged in order of stand number, while there is also an index of exhibitors.

There are upwards of 400 illustrations in this remarkable issue. A supplement is included in the

form of a very useful "fault-finding chart." The object of this chart is to enable all manner of engine defects to be readily located, and it should be of equal utility to cyclecarists.

It should be noted that "Motor Cycling" is published on Tuesdays, in a distinctive cover printed in light green and black on white paper. It has a reputation for being "first out" with the news.

CYCLECARS AT OLYMPIA.

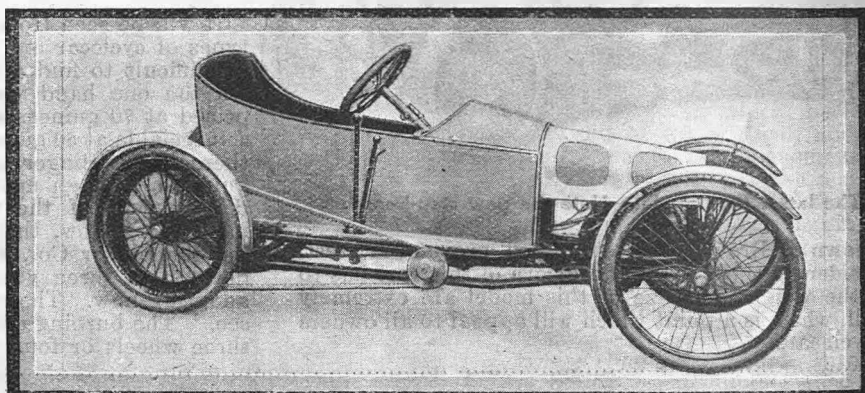


SWIFT.

Engine ..	..	Twin-cylinder, vertical, water-cooled, 7 h.p.
Frame ..	..	Tubular, with underframe.
Transmission ..	..	Shaft to gearbox and propeller shaft to live axle.
Clutch ..	..	Leather-to-metal cone.
Steering ..	..	Worm and sector.
Gearbox ..	..	Providing three speeds and a reverse.
Tyre sizes ..	..	650 mm. by 85 mm.
Body details ..	..	Two-seater with torpede, with scuttle dash.
Price ..	..	£125.
Weight ..	..	5 cwt.
Brakes ..	..	Internal on back wheels, external on transmission shaft.

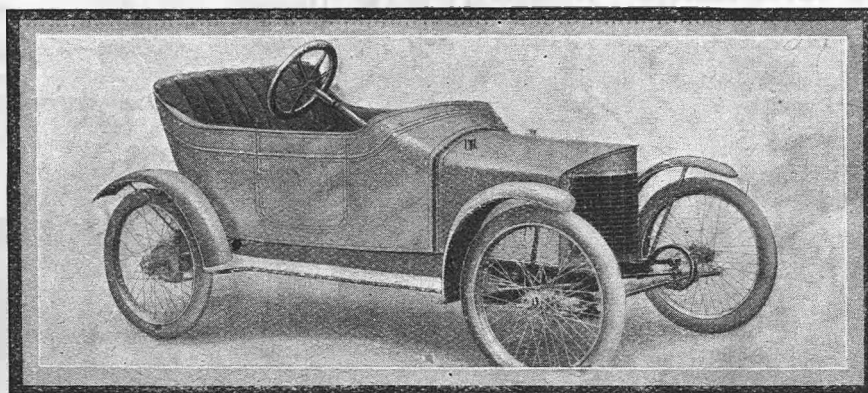
ROLLO MONOCAR.

Engine ..	..	4½ h.p., single-cylinder, air-cooled Precision.
Frame ..	..	Tubular.
Transmission ..	..	From engine by silent chain to the countershaft gearbox, from adjustable pulleys on ends of countershaft by belts to the back wheels.
Clutch ..	..	Plate clutch on gearbox.
Tyre sizes ..	..	26 in. by 2¼ in.
Brakes ..	..	Contracting, on back wheels.
Wheels ..	..	Fixed wire.
Weight ..	..	10 guineas.
Price ..	..	5 to 1 and 9½ to 1.
Gear ratios ..	..	By cables and large roller.
Steering ..	..



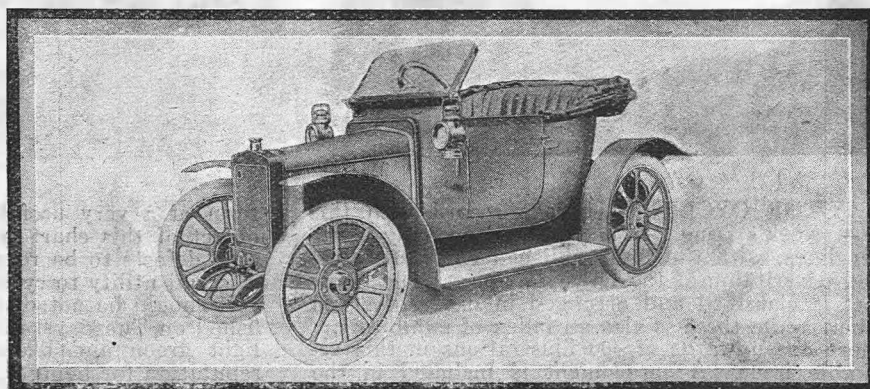
WALCYCAR.

Engine ..	..	6 h.p. twin-cylinder air-cooled J.A.P., bore 85 mm., stroke 85 mm.
Frame ..	..	Pressed channel steel with special springing.
Transmission ..	..	Through two-speed gearbox to live back axle.
Clutch ..	..	Metal-plate type.
Body details ..	..	Roomy two-seater with scuttle dash.
Brakes ..	..	Band brakes on back wheels, operated by lever, and foot brake on transmission shaft.
Steering ..	..	Direct, by large wheel.
Gear ratios ..	..	5¼ and 10 to 1.
Price ..	..	95 guineas.



PERRY.

Engine ..	..	8 h.p., two-cylinder, vertical, water-cooled, bore 72 mm., stroke 108 mm.
Frame ..	..	Pressed channel steel.
Transmission ..	..	Through gearbox and cardan shaft to overhead worm on live back axle.
Clutch ..	..	Metal-to-metal cone.
Steering ..	..	By rack and pinion, with adjustable ball joints.
Gearbox ..	..	Provides three speeds and a reverse.
Brakes ..	..	Two sets of internal expanding brakes.
Price ..	..	130 guineas, complete.



The Cyclecar of 1913

A Critical Review of Leading Models, with Stand Numbers of those exhibited at Olympia.

The Olympia Show is open from Monday, 25th November, to Saturday, 30th November, inclusive. Admission 1s.

THE year 1913 will undoubtedly go down in the history of the motor world as the cyclecar year, and this is not to be wondered at considering that at the present moment there are over 70 different makes of these handy little vehicles. In general, all cyclecars can be grouped into two classes, those whose main features follow car practice, and those in which motor-bicycle design predominates. Some, naturally, may present difficulties in being placed under one of

The following report on the Cyclecar of 1913 is divided into sections as follows: Engines—Transmission—Steering—Frames and Bodies—Suspension—Brakes—Wheels and Tyres.

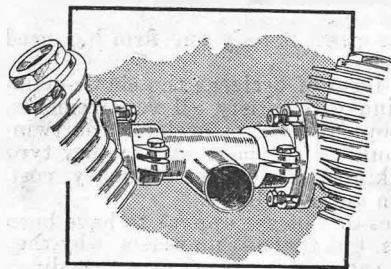
obtain successful results, that the engine should be specially designed for the work it has to do. A motor-bicycle engine placed in a cyclecar frame will not give such good service as another type of engine specially designed.

Air-cooling is employed on a large majority of cyclecars, and it would seem as if this system is satisfactory in practice. A fan is generally used to assist in the cooling, but in certain machines, such as the Morgan (Stand 18) and the new G.N. (Stand 31), where the engine is set across the frame, it has been found possible to dispense with this fitment.

Where a motor-bicycle engine has been adopted, it is customary to fit an extra flywheel on the crankshaft, to provide the necessary slow running. This is done in the Duo (Stand 33) and in the Warne (Stand 118).

The majority of cyclecar makers do not fit engines of their own manufacture, but prefer to fit those made by proprietary companies whose products have a high reputation in connection with motor-bicycles. There are notable exceptions, however, who prefer to fit engines made throughout at their own works, or under their direct supervision. These are Chater-Lea (Stand 78), A.-C. (Stand 60), P.M.C. (Stand 68), Wilkinson (Stand 22), Premier (Stand 111), Humber (Stand 52), and others.

In certain cases makers have produced engines of about 1000 cc. capacity for high-powered motor-bicycles for use with sidecars, and when commencing



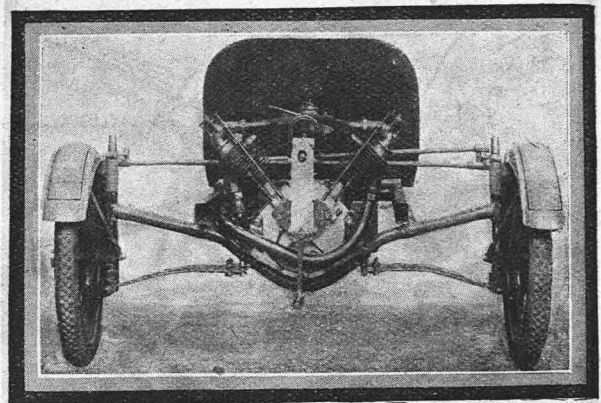
Induction piping on the Premier cyclecar engine, showing method of adjustment and detachment.

point which divides experts into two camps is the question whether these machines should have three or four wheels. At the present time no agreement is likely to be arrived at in this controversy, as examples of each design can be found among the most prominent makes.

In the following columns the various essential parts of the cyclecar are reviewed, and the reader will probably come to the conclusion that there exists a great diversity of opinion on every feature of their design. At first it might be supposed that this divergence was a drawback to the progress of the movement, but, after a little thought, it will be admitted that this state of affairs is the very best omen possible for the future of the cyclecar, for this reason: the question whether water or air-cooled engines, cable or rod-steering, belt, chain, or shaft drive, should be employed, will be fought out, and doubtless, by the process of the survival of the fittest, the future and ideal type of machine will be evolved.

Engines.

The simplest engine for a cyclecar is the air-cooled single-cylinder. Where greater power is required than can satisfactorily be obtained from a single, a twin engine is employed. It is important, in order to



How the 90° twin J.A.P. engine is fitted on the Matchless cyclecar. (Note the overhead inlet valves and novel position of the magneto).

THE CYCLECAR OF 1913 (contd.).

Types of engine, one, two, or four cylinder—Arrangement and cooling of cylinders—Brough synchronised valve gear—The transmission problem—Reverse or no reverse.

the manufacture of cyclecars they have employed these, with certain modifications.

The engines fitted have one, two, or four cylinders, but the greater proportion have twin-cylinder engines. There are, however, a few makers fitting four-cylinder water-cooled engines, such as the Wilkinson (Stand 22) and the Singer (Stand 79). A number have single-cylinder engines, but their cubic capacity does not nearly come up to the limit allowed.

The A.-C. (Stand 60) and the P.M.C. (Stand 68) have single-cylinder engines, the dimensions of which are 95 mm. by 102 mm. The Wall Tricarriage (Stand 120) is usually fitted with a single-cylinder engine of 89 mm. bore by 96 mm. stroke, but a twin can be provided if desired, while the Rudge cyclecar (Stand 96) is also fitted with a single-cylinder engine of 85 mm. by 132 mm. stroke.

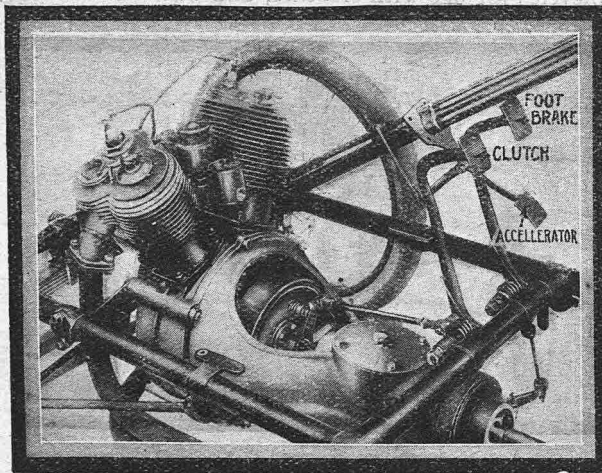
The large majority of the cyclecar engines, however, are twin-cylinder, usually of the V type, but there are a few exceptions, as on the G.W.K. (Stand 34), the L.E.C., and the Swift (Stand 100), where the engine is a vertical two-cylinder with water-cooling. In the V-twin engines employed the angle between the cylinders varies from 50 degrees in the case of the Premier (Stand 111) to 180 degrees in the case of the Douglas.

The G.N. (Stand 31), Gordon (Stand 38), and Matchless (Stand 74) have their cylinders set at right angles to one another, and this setting is claimed to give a perfect balance.

There is only one make of belt-driven cyclecar provided with a water-cooled engine, and that is the Super (Stand 128), the engine being a twin-cylinder Anzani, either 75 mm. by 120 mm. or 85 mm. by 85 mm.

The general tendency in cyclecar engine design appears to be in the direction of obtaining smoother running and longer wearing powers. Air-cooling is satisfactory when properly applied, and where lightness, cheapness, and simplicity are required it appears to fulfil all requirements.

J.A.P. and Precision engines are largely fitted by cyclecar makers, and the company manufacturing the former have paid special attention to designing an engine suitable for cyclecars. They have thus evolved

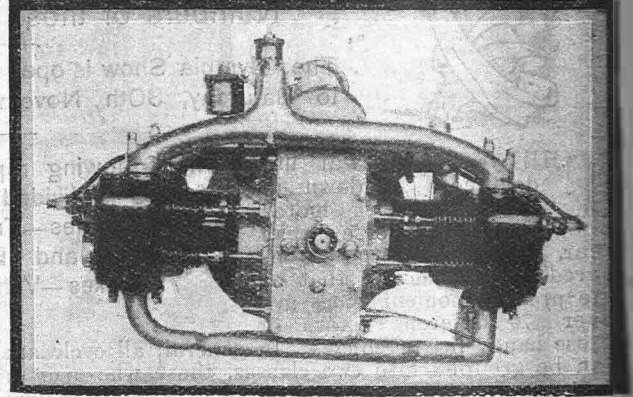


The air-cooled V-type engine on the Humber cyclecar, showing the clutch and pedal control.

a 90-degree twin with overhead inlet valves, the cylinders of which are 85 mm. by 95 mm. stroke. Another interesting engine is the Brough, fitted to the cyclecar of that name (Stand 36). Its chief characteristic is the patent synchronized valve gear, which assists in its smooth running.

It does not appear that the four-cylinder engine will be largely used for cyclecars, for its use will be confined to the more expensive types, where the purchaser is willing to pay for the extra smoothness of running and complication.

The horizontally-opposed twin, as fitted to the new Douglas, has, no doubt, a great future for cyclecar



The horizontally-opposed Douglas engine, which is particularly well suited for cyclecar work.

work, but up to the present only one firm has used this type of engine.

For the cheapest form of cyclecar the single-cylinder air-cooled engine will satisfy all requirements, but for the most popular kind of cyclecar the twin-cylinder engine should be the most satisfactory type to be employed, taking into account efficiency, cost, absence of vibration and simplicity.

Two-stroke engines do not yet appear to have been applied to cyclecars, but there is no reason why they should not give as satisfactory service in this direction as they do on motor-bicycles and cars.

Transmission.

The transmission of cyclecars may be effected either by means of a positive drive, or by friction discs or belts. The two chief types are fairly equally divided.

There are a number of companies manufacturing cyclecars who have arranged their transmission on the same lines as that of a car. In this method, the power is transmitted through some form of friction clutch to a gearbox, which provides a certain fixed number of speeds of constant ratio. A propeller shaft connects the gearbox with some form of live axle, embodying a differential gear. This type of transmission is weatherproof and efficient, but it is comparatively expensive to make. Among these companies applying this system to their cyclecars are Chater Lea (Stand 78), Arden (Stand 27), Wilkinson (Stand 22), Humber (Stand 52), Singer (Stand 79), and Alldays (Stand 106).

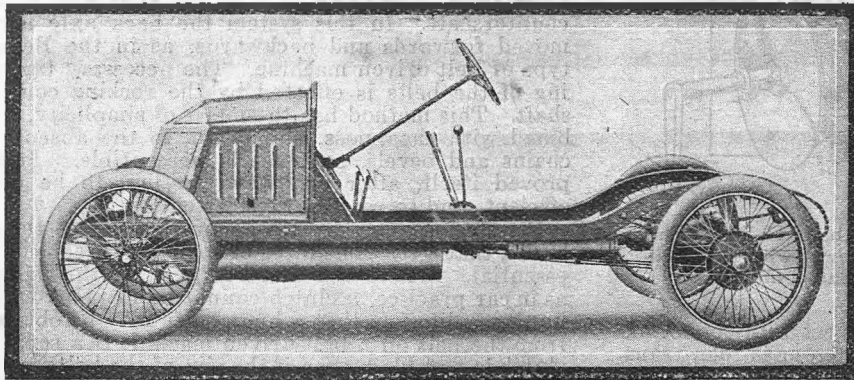
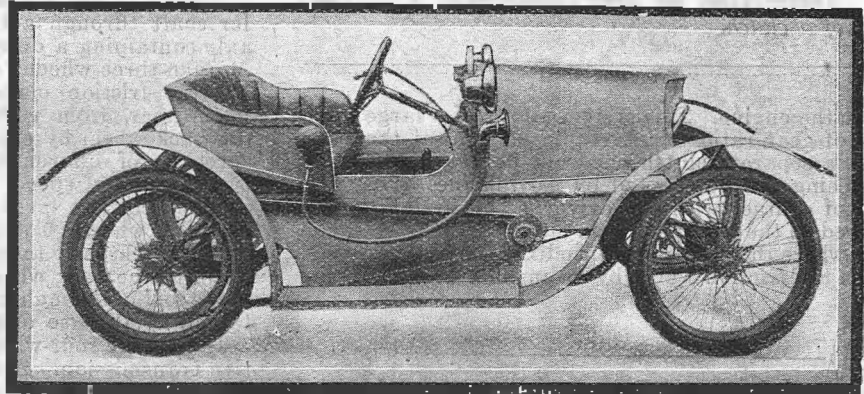
There is a simplification of this system, in which the power is transmitted from the engine to the gearbox, and from the gearbox to the live axle by means of chains. In the former system, it is usual to provide three speeds, and generally a reverse. In the latter system, either two or three speeds are fitted, while a reverse is not usual. In the case of the Premier cyclecar (Stand 111), which embodies this system, a reverse is provided at an extra cost.

The second class of transmission is that in which friction discs are relied on to transmit the power

CYCLECARS AT OLYMPIA.

KENDALL.

Engine	8 h.p. twin-cylinder, air-cooled J.A.P. or 7.5 h.p. Peugeot.
Frame	Ash of special construction.
Transmission ..	Belt.
Clutch	Plate-type running in oil.
Steering	Direct by means of wheel.
Gear ratios	4 and 7-1.
Tyre sizes	650 mm. by 65 mm.
Body details ..	Two-seater, well upholstered.
Price	With J.A.P. engine £95, with Peugeot engine, £83 5s.
Weight	5 cwt., 6 cwt. with hood and screen.
Brakes	Foot and side.
Wheels	Fixed wire.

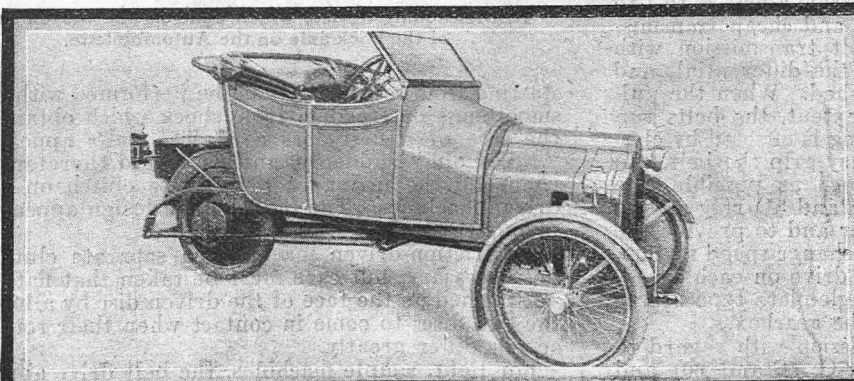
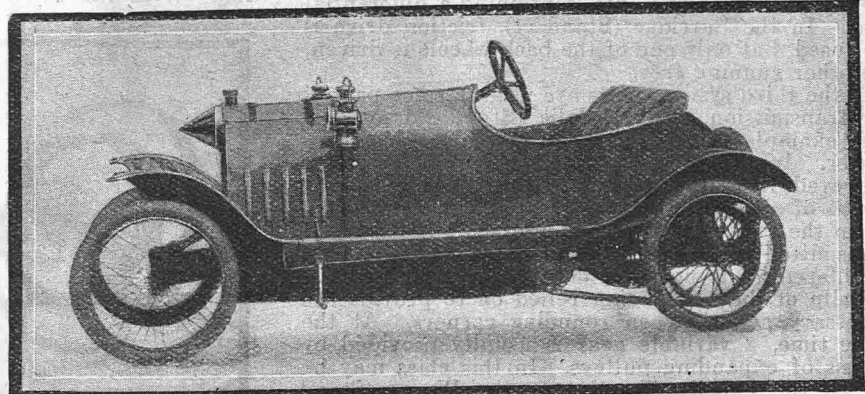


WILTON.

Engine	9 h.p. twin-cylinder 90-degree air-cooled J.A.P., bore 85 mm., stroke 93 mm.
Frame	Inverted U-section pressed steel.
Transmission ..	Through gearbox, providing three speeds and a reverse through a cardan shaft to a bevel-driven live axle.
Weight (chassis)	5½ cwt.
Clutch	Multiple-disc.
Steering	Worm and segment, with special thrust bearings.
Lubrication ..	By sight-feed drip, and hand pump regulated by thumb-screw.

G.N.

Engine	G.N. 90° twin-cylinder, 80 mm. by 98 mm.
Frame	Armoured ash.
Transmission ..	Chain sliding gear and double belt.
Clutch	Double disc.
Steering	Ackermann, with duplicated wire cables.
Gear ratios	4½-1 and 7¾-1.
Tyre sizes	650 mm. by 65 mm.
Body details ..	Light torpedo, two-seater.
Price	95 guineas.
Weight	100 lb.
Brakes	Belt rim.
Wheels	Detachable wire.
Suspension	Long laminated springs.



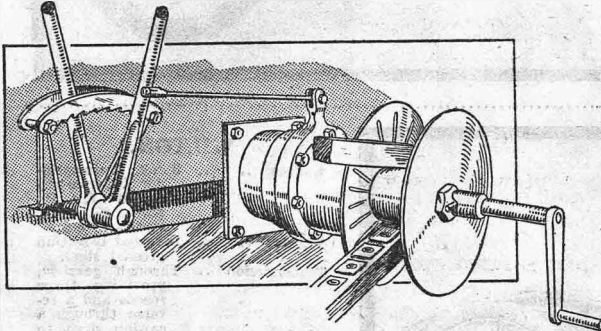
MATCHLESS.

Engine	9 h.p. two-cylinder 90-degree air-cooled J.A.P., 85 mm. by 95 mm.
Frame	Pressed channel steel.
Transmission ..	Cardan shaft and bevel drive to back wheel; two-speed gearbox.
Clutch	Ferrodo-lined cone.
Steering	Direct, with geared wheel.
Tyre sizes	Back wheel 700 mm. by 85 mm., front wheels 650 mm. by 65 mm.
Body details ..	Two-seater, with scuttle dash and side doors.
Price	100 guineas, complete.

THE CYCLECAR OF 1913 (contd.).

Friction drive—Belt drive and variable gear—Transmission on three-wheelers—Advantages of a clutch.

from the engine. This system allows of a large number of gear ratios being employed, and at the same time a separate clutch need not be provided, as de-clutching can be effected by moving the driven disc out of contact with the driver. This system is employed on the Girling (Stand 110) three-wheeled cyclecar, where the power is transmitted to the back wheel from the friction wheel by means of a bevel. In the



One of the expanding pulleys on the 1913 Duo. The pulley operating lever is also shown, whilst the belt is depicted in the free-engine position.

G. W. K. (Stand 34) the engine is set with the crankshaft across the frame, and the power is then transmitted from the flywheel to a friction-disc set at right angles to it, which in turn transmits the power by a cardan shaft to a live axle, containing a differential gear. In the Surridge (Stand 21), friction drive is also used, but only one of the back wheels is driven, the other running free.

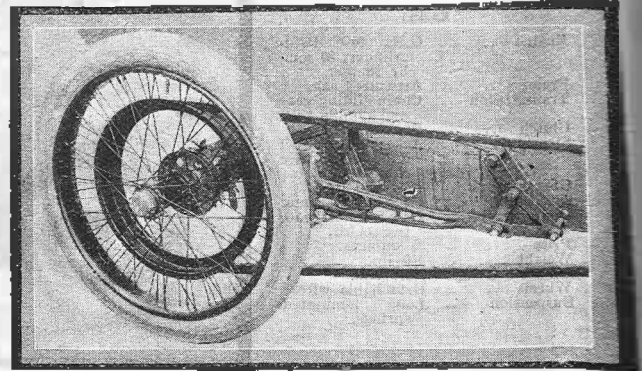
In the third system, belts are used in some part of the transmission. The Bedelia (Stand 23) was the first example of the light belt-driven tandem two-seater. In this type of transmission the power is conveyed from the engine to the countershaft by means of a chain, either of the roller or silent type. From the two ends of the countershaft the drive is transmitted to the back wheels by means of two belts. A differential is not provided on the countershaft, the slip of the belts being relied on to provide the necessary action, when rounding corners. At the same time, a variable gear is usually provided by means of expanding pulleys. In this class may be placed the Sabella (Stand 118), the Warne (Stand 118), the Duo (Stand 33), and the Rollo (Stand 119). The gear ratios obtained range from about $3\frac{1}{2}$ to 1 to 9 to 1. This provides a simple and cheap transmission, as by using a double belt transmission with variable pulleys, the gearbox, the differential, and sometimes the clutch are abolished. When the pulleys are open to their widest extent, the belts run free on the bottom, and clutching is effected by closing up the pulley faces until they grip the belt. In order to save the belts as much as possible, the makers of the G. N. cyclecar (Stand 31) rely on the belts only to transmit the power and to provide the differential action. A separate change-speed system, giving two speeds with a direct drive on each speed, is provided; a clutch of the single-plate type serves to disconnect the engine from the gearbox.

There is no standard transmission with regard to three-wheel cyclecars. The A. C. (Stand 60) and P. M. C. (Stand 68) employ an epicyclic gear in the

back hub, the drive being transmitted from the engine to the back axle by a single roller chain. In the Wall tri-carriage (Stand 120), which has one wheel in front and two behind, the engine drives a propeller shaft through a two-speed gear to a live back axle containing a differential gear. On the popular Morgan three-wheeler (Stand 18), the engine, through a large friction clutch, transmits the power to a bevel gear, from which the drive is continued to the back wheel by either of two chains passing over sprockets of different diameter, these serving for the two changes of speed. The Matchless cyclecar has a cone-clutch, two-speed gearbox and a bevel drive to the back wheel. The Autotrix drives through a disc clutch by chain to the gearbox and thence by another chain to the back wheel, an alternative transmission being belts throughout, a variable gear being obtained by the use of expanding pulleys.

The Rudge four-wheeler is provided with a distinctive transmission. A multi-disc clutch transmits the drive from the engine shaft to a rocking countershaft by means of a single belt, the final drive being by belts from expanding pulleys on each end of the countershaft. In this system the back axle is not moved forwards and backwards, as in the Bedelia type of belt-driven machine. The necessary tightening of the belts is effected by the rocking countershaft. This method has the merit of simplicity, combined with cheapness, and owing to the absence of chains and bevels, no noise is perceptible. It has proved itself, after prolonged testing, to be quite efficient, and to require little attention.

It would appear, from a general survey of the exhibits, that a friction clutch of some sort is considered essential. Where the drive is positive throughout, as in car practice, a clutch cannot be dispensed with, but it would seem that a longer life may be obtained from the belt on a belt-driven machine if a separate clutch is provided, than if the slip of the belts, as the pulleys are closed up, is relied on for smooth starting. With the latter system, we have found that



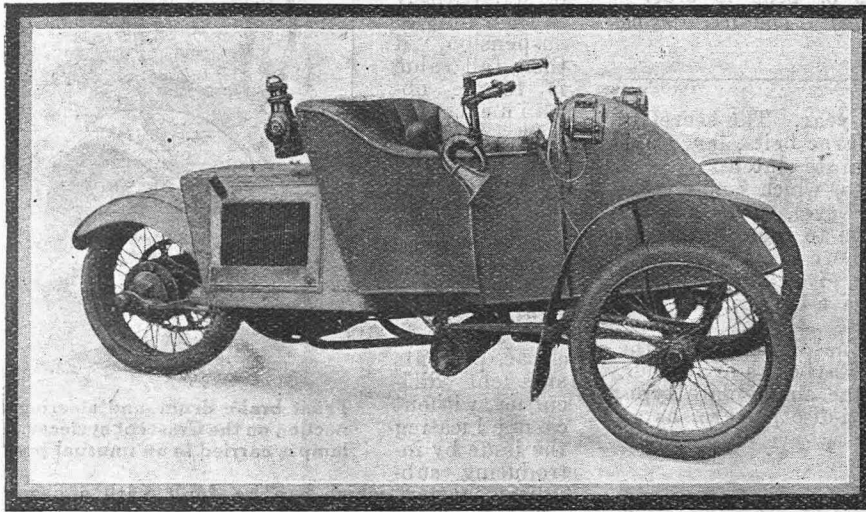
Belt-tensioning device, which controls the movement of the back axle on the Automobilette.

starting from rest can seldom be performed with that smoothness or freedom from shock which obtains in the case of a first-class car. The belts appear to "take hold" suddenly, and we would therefore commend the fitting of a separate clutch on belt-driven machines. The tendency of design appears to favour the inclusion of the clutch.

On friction-driven machines, a separate clutch is not necessary, but care must be taken that flats are not formed on the face of the driven disc by allowing the two discs to come in contact when their rotative speeds differ greatly.

For light, simple machines, the belt drive appears to be satisfactory, as witnessed by the number of

CYCLECARS AT OLYMPIA.

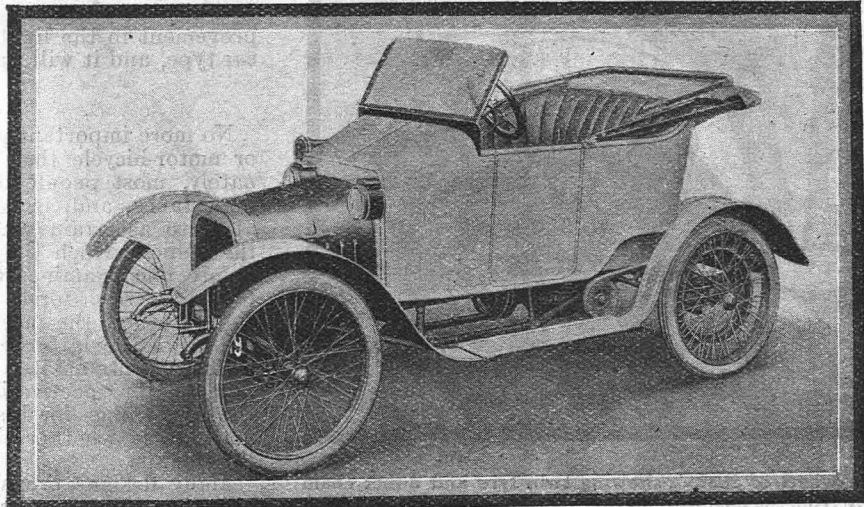


P.M.C. MOTORETTE.

- Engine .. Single - cylinder, water cooled, 65 mm. by 102 mm. Tubular steel.
- Frame .. Tubular steel.
- Transmission .. Chain from engine to epicycloid gear in back wheel.
- Clutch .. Combined with gear in back hub.
- Steering .. Direct by tiller.
- Gearbox .. Two speeds forward.
- Tyre sizes .. Back 700 mm. by 85 mm., front 650 mm. by 65 mm.
- Body details .. Two-seater with sloping dash.
- Price .. £105.
- Weight .. 6½ cwt.
- Brakes .. Foot brake on rear wheel, front wheel brakes 3 guineas extra.
- Wheels .. Wire.

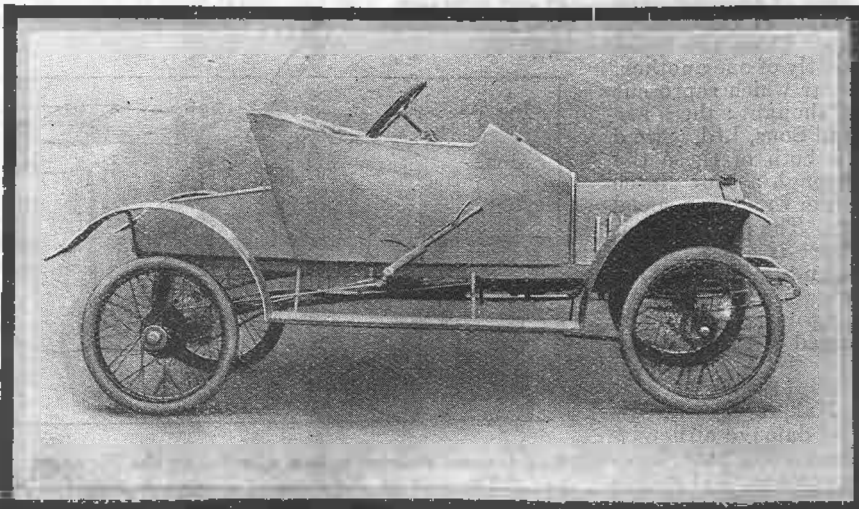
DAY-LEEDS.

- Engine .. Two-cylinder, air cooled, bore 85 mm., stroke 88 mm., 999 c.c. capacity.
- Frame .. Weldless-steel tubing, trussed girder design.
- Transmission .. By shaft to gearbox on countershaft and thence to back wheels by belt.
- Clutch .. Cone faced with vulcanite.
- Steering .. By wheel direct.
- Gear ratios .. 40-1, 6½-1, 4-1, and reverse.
- Tyre sizes .. 650 mm. by 65 mm.
- Body details .. Two-seater, settable dash, dummy radiator.
- Price .. £110, or with hood, lamps, horn and screen. £120.
- Weight .. 5½ cwt. complete.
- Brakes .. Two brakes operated by hand and foot levers on rear wheels.
- Wheels .. Detachable and interchangeable.



WILKINSON.

- Engine .. Four - cylinder, water cooled, 50 mm. by 75 mm., capacity 848 cc.
- Frame .. Pressed steel.
- Transmission .. Cardan shaft through three-speed gearbox to bevel-driven back axle.
- Lubrication .. Automatic.
- Steering .. Worm and nut.
- Gear ratios .. 4½-1, 7-1, and 11¼-1, also a reverse.
- Tyre sizes .. 28 in. by 2½ in.
- Body details .. Two-seater.
- Price .. 150 guineas with body.
- Weight .. 9 cwt.
- Gearbox .. Three speeds and reverse, with direct drive on top gear.
- Wheels .. Wire.
- Ignition .. Eisemann magneto, self-contained type.
- Carburetter .. Stewart-Precision.



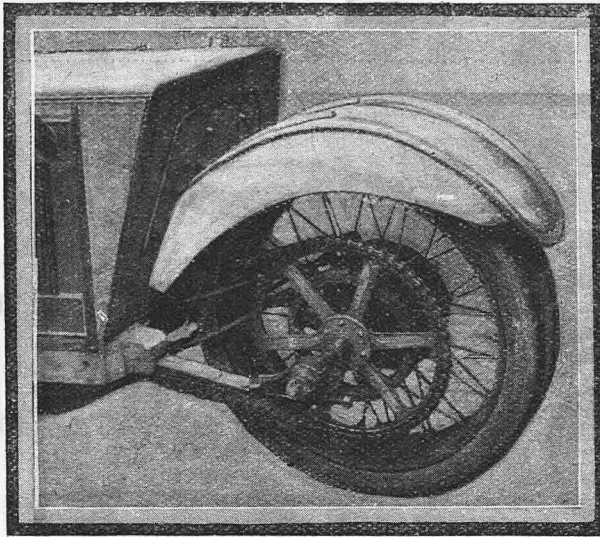
THE CYCLECAR OF 1913 (contd.).

A knotty problem—Should the cyclecar follow car or cycle practice?—Chains or belts to order—Vital importance of steering—The irreversible type and its advantages.

makers who retain it for next year. The secret of successful belt transmission is large belts, large pulleys, and the provision of a separate clutch.

In the more elaborate designs, which embody the gearbox and a live axle, worm, bevel, or chain is employed for the final transmission to the differential, which is usually provided. Where a chain is used, adequate protection should be given to the chain, but there does not appear to have been much effort towards this end.

Clutches are either of the cone or disc type, the former being lined with either Raybestos or leather. The disc clutches may be of the single-plate type, as on the G.N., or of the multi-disc pattern, as on the L.M.



Rear-wheel of P.M.C., showing twin tyre and direct chain drive from the engine to the epicyclic gear in the back wheel.

The design of cyclecar transmission appears to be proceeding along two different lines of thought. The one line reproduces the chief points of car design, and the other motor-bicycle design. These two types appear to be developed independently of one another, but there are two makes of cyclecar which represent a combination of the two lines of thought; these are the machines made by Job Day and Sons, Ltd. (Stand 95), and the L.E.C. cyclecar. In both of these the power passes from the engine through a cone clutch to a shaft, which transmits the power to a three-speed gearbox, thence to a countershaft. The final drive is by belts to the back wheels. There is a second distinctive point, namely, the provision of a differential, the makers considering that it is unfair to rely upon the belts to make the over-running on corners. The Day machine may also be obtained with chains in place of belts.

The general tendency appears to be towards greater reliability of the transmission. Makers are endeavouring to remove all possibility of damage either by the weather or by careless handling. We note, however, in the case of shaft-driven machines, that radius and torque rods are seldom employed, the suspension springs being relied upon to take their place. Car

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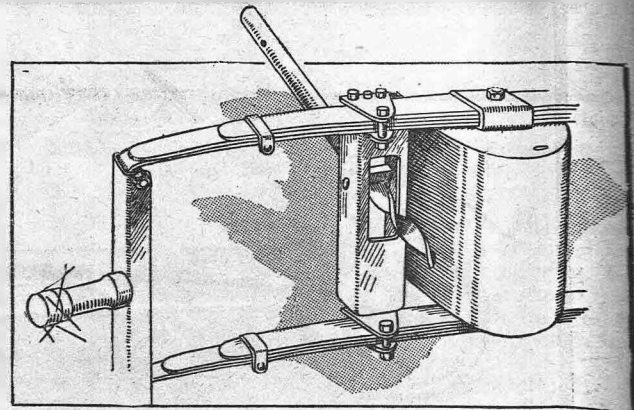
makers have found that the springs should be left entirely to their duty of suspension, if their full value is to be obtained. On such evidence as this, we should consider it advisable to provide radius and torque rods, as the springing of a light vehicle, such as the cyclecar, presents sufficient difficulties, without complicating the issue by introducing subsidiary matter, which can be dealt with separately.

The light, belt-driven cyclecar will be developed side by side with the more elaborate machine on car lines. Their prices will differ, likewise the classes to which they appeal. There is more room for improvement in the light, belt-driven type than in the car type, and it will appeal to a larger class.

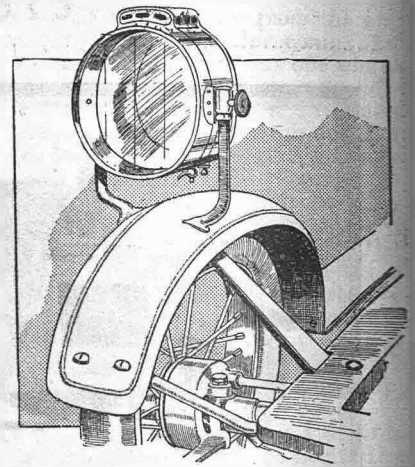
Steering.

No more important part exists on any car, cyclecar or motor-bicycle than the steering gear. Unfortunately, most people do not realize its tremendous importance, and, in consequence, never even glance at it to ascertain which design is incorporated in the vehicle which they propose to purchase. Even before one examines the engine, one should attend to the steering, for the former, on refusing to work, simply brings the machine to a standstill, while the failure of the latter may cause an accident too terrible to contemplate. It must, therefore, be urged upon the prospective buyer of a cyclecar that one of the first things for him to find out about his future machine is whether the steering arrangements are satisfactory.

Many designs prevail; in fact, they are innumerable, but they may be classed, perhaps, under three heads: the worm and segment, the direct, and the cable type. The first is the design universally adopted in car practice, and has stood well the test of time.



The unusual steering system adopted on the Parnacott cyclecar. The end of the steering column is provided with a screw, and as this is rotated it forces the whole of the front carriage sideways.

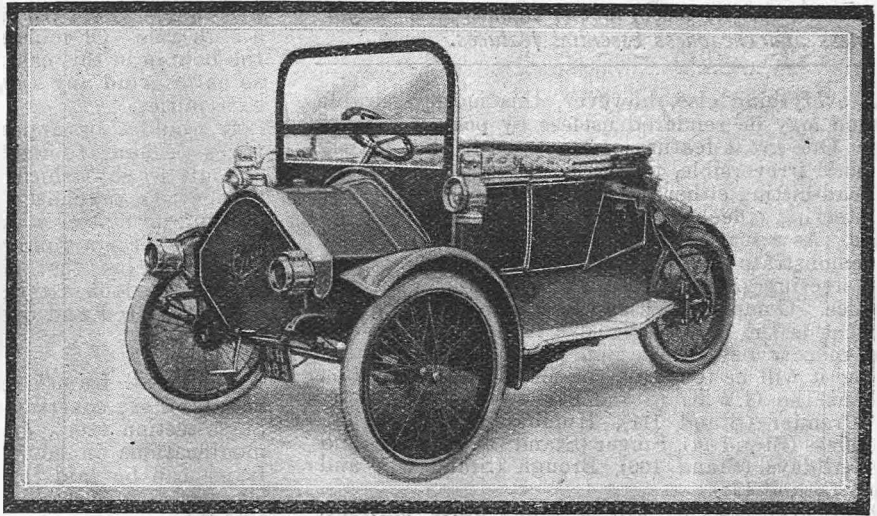


Front brake drum and steering connection on the Crescent cyclecar. The lamp is carried in an unusual position.

CYCLECARS AT OLYMPIA.

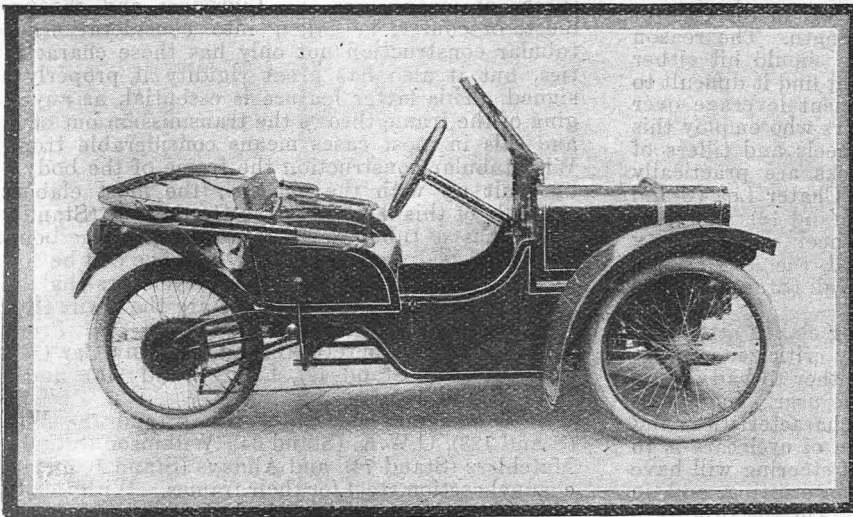
ERIC.

Engine ..	10 h.p. twin-cylinder horizontal, water-cooled, 85 mm. bore, 96 mm. stroke.
Lubrication ..	Automatic.
Ignition ..	High-tension magneto.
Cooling ..	By thermo-syphon, gilled-tube radiator.
Frame ..	Steel tubes, 1¼ in. diameter.
Transmission ..	By cardan shaft to bevel-driven back axle.
Clutch ..	Leather-faced cone mounted on ball bearings.
Steering ..	Wheel, with ball-bearing steering heads.
Gearbox ..	Three speeds forward and reverse.
Tyre sizes ..	700 mm. by 65 mm.
Body details ..	Two-seater Sociable.
Price ..	£135 complete.
Weight ..	About 8 cwt.
Brakes ..	Operated by side lever and pedal.
Wheels ..	Made of special large-gauge wire.



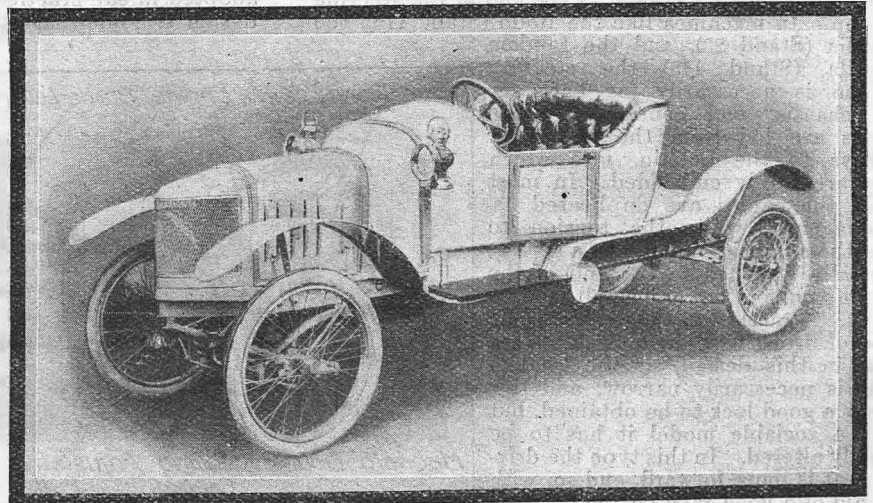
MORGAN.

Engine ..	8 h.p. twin-cylinder air-cooled J.A.P., 85 mm. bore, 85 mm. stroke.
Frame ..	Tubular, of special construction.
Transmission ..	By shaft to bevel on countershaft, thence by chains to back wheel.
Clutch ..	Leather-lined cone.
Steering ..	Direct by wheel.
gear ratios ..	49-1 and 8-1.
Tyre sizes ..	28 in. by 2½ in. standard, non-skid on back wheel.
Body details ..	Two-seater, made of wood and sheet steel.
Price ..	85 guineas.
Weight ..	3 cwt.
Brakes ..	Two band on back wheel, controlled by hand lever and pedal.
Wheels ..	Wire, back wheel easily removable.



SABELLA.

Engine ..	10 h.p. J.A.P. 900 twin-cylinder.
Transmission ..	Chain to countershaft, V-type belts to back wheels.
Gears ..	By expanding pulleys, giving a range from 4-1 to 10-1.
Clutch ..	Clutch action taken by the belts.
Brakes ..	Two working independently.
Body details ..	Two-seater Sociable or tandem model if preferred.
Price ..	£115 complete with lamps, hood and screen.
Wheels ..	Wire, for use with Stepney spare wheel.
Tyre sizes ..	28 in. by 2½ in.
Weight ..	8¼ cwt. complete.
Suspension ..	Front quarter-elliptic; rear half-elliptic.
Lubrication ..	Automatic.



THE CYCLECAR OF 1913 (contd.).

Leverage with direct steering—Cable and bobbin steering—Used on the central pivot design—Frame design; wood, tube or channel steel—Lightness and cheapness essential features.

Like everything else, however, this most desirable method may be rendered useless by poor workmanship. One great feature of this type is that it may be made irreversible, that is to say, no obstacle on the road hitting either of the front wheels can rotate the steering wheel or wrench it out of the driver's hands. As a matter of fact, few makers would care to demonstrate this feature on their machines, as most steering gears only approximate to this ideal in practice. Compared with other methods, worm and segment is the most expensive to manufacture, the next in cost being rack and pinion, and in consequence it will be found on the more costly cyclecars, such as the G.W.K. (Stand 34), Wilkinson (Stand 22), Premier (Stand 111), Humberette (Stand 52), Matchless (Stand 74), Singer (Stand 79), Swift (Stand 100), Alldays (Stand 106), Brough (Stand 36), and Super (Stand 128).

Direct-type steering will be found quite efficient, if the design employed allows the driver to possess ample leverage over the system. For this purpose a large steering wheel is necessary, or, in the case of tiller steering, a lever of good length. The reason for this is that if any obstruction should hit either of the front wheels, the driver might find it difficult to keep control unless he had sufficient leverage over their motion. Naturally, all makers who employ this design have provided steering wheels and tillers of sufficient size, so that road shocks are practically imperceptible. Such cyclecars as Chater Lea (Stand 78), Gordon (Stand 38), Morgan (Stand 18), and Kendall (Stand 161) fit a steering wheel, while among those that favour the tiller method, the A.C. (Stand 60), Girling (Stand 110), and the Wall (Stand 120) are prominent.

Lastly, the cable type of steering claims attention. Perhaps no method is so adversely criticized, but its failures can nearly all be traced either to bad design or gross neglect on the part of the user. Simplicity and cheapness are its two main characteristics, and there is no doubt that if the price of cyclecars is to be kept low, some such method of steering will have to be adopted. Some designs are interesting, and, in fact, hardly any two are identical. The essentials are one or more cables, coupled to the steering axles, and wound round a bobbin at the end of the steering column. In machines like the Rollo (Stand 119), the Bedelia (Stand 23), and the tandem Sabella (Stand 118) the steering column is necessarily far back on the chassis, and consequently the cables are led from the axle over pulleys to the bobbin, into which they are firmly embedded. In most cases the cables are duplicated as a safeguard, while the tension to keep them taut is supplied by a spring, generally attached to the end of the steering column, so as to pull it rearwards. Practically, the central-pivot type of front axle is almost always used in this design, as the tandem body is necessarily narrow, and this allows a good lock to be obtained, but with a sociable model it has to be slightly altered. In this type the driving seat is more forward, and so, with the aid of a good rake on the steering columns, the manufacturer is able to get the bobbin directly between the

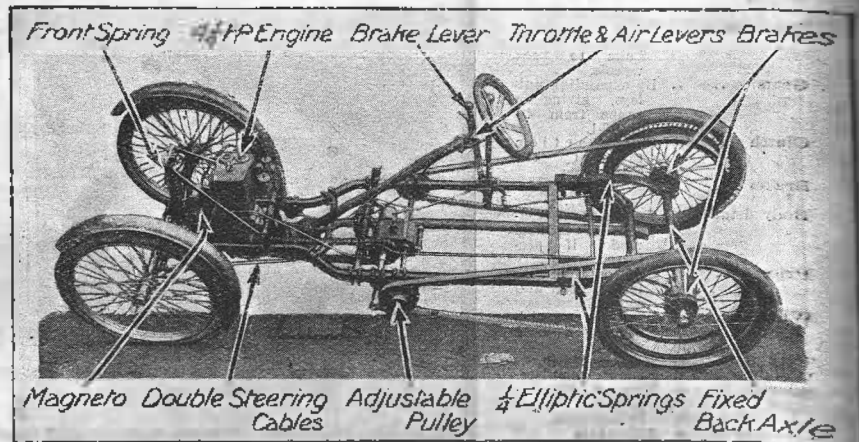
front wheels. This is a great convenience, as it does away with all pulleys, thereby simplifying matters. The Duo (Stand 33) and the G.N. (Stand 31) both employ this method in conjunction with the Ackerman principle, where each front wheel is pivoted on a stub axle. Of course the cables cannot be fixed to the bobbin in this case, but they are kept in tension so as to avoid any slip, by powerful springs at their extremities.

It would thus appear that each type has advantages peculiar to itself, and, in consequence, it is difficult to say which is the most preferable. The prospective purchaser should, however, first satisfy himself, no matter what system he considers correct, that the design followed is trustworthy. He must also remember that no type of steering should be allowed to look after itself, but should be periodically inspected and overhauled if necessary.

Frames and Bodies.

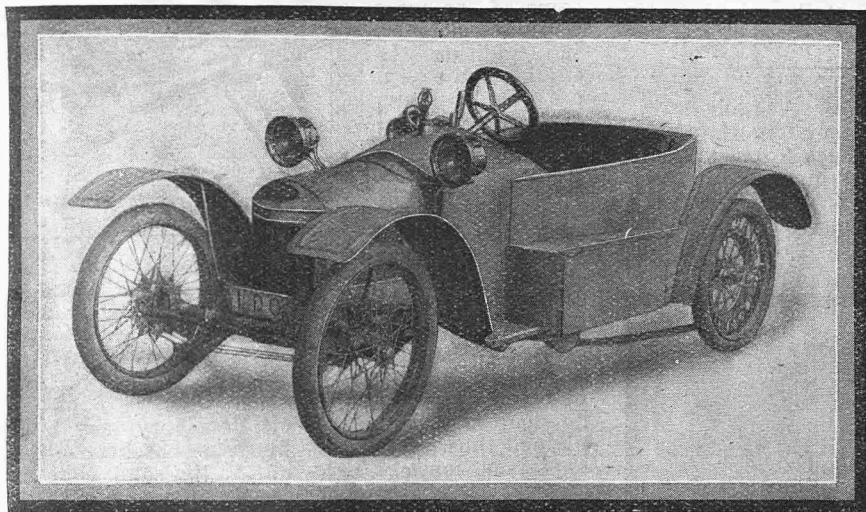
Nearly all frames may be classed under three heads: those constructed of steel tubing, channel or angle-section steel, or wood. There are, of course, modifications in some models, but in general any frame can be said to belong to one of these types. The majority are, perhaps, of tubular construction, and this is not to be wondered at, as a great number of cyclecar manufacturers are, or have been, manufacturers of motor-bicycles. Lightness and cheapness must, of course, be taken into consideration, and tubular construction not only has these characteristics, but it also has great rigidity if properly designed. This latter feature is essential, as any sagging of the frame throws the transmission out of line, and this in most cases means considerable trouble. With tubular construction the frame of the body can be built up with the chassis; the most elaborate example of this method is the Gordon car (Stand 38), which has a tubular framework outlining bonnet, dash, and body, while another instance can be found in the Rudge (Stand 96). Other cyclecars that have their frame made of steel tubes are the Swift (Stand 100), Rollo (Stand 119), Leeds (Stand 95), Premier (Stand 111), Humberette (Stand 52), Tiny Car (Stand 15), Autotrix (Stand 47), L.M. (Stand 115), and the Wall (Stand 120).

Such machines as Chater Lea (Stand 78), Wilton (Stand 123), G.W.K. (Stand 34), Wilkinson (Stand 22), Matchless (Stand 74), and Alldays (Stand 106) employ channel-section steel for their frames. With this type of construction a separate body having a frame of its own is generally used, a method which is always adopted in car practice. There is no doubt that this design is somewhat of a luxury, and is employed



The Rollo monocar showing steering gear and chassis work.

CYCLECARS AT OLYMPIA.

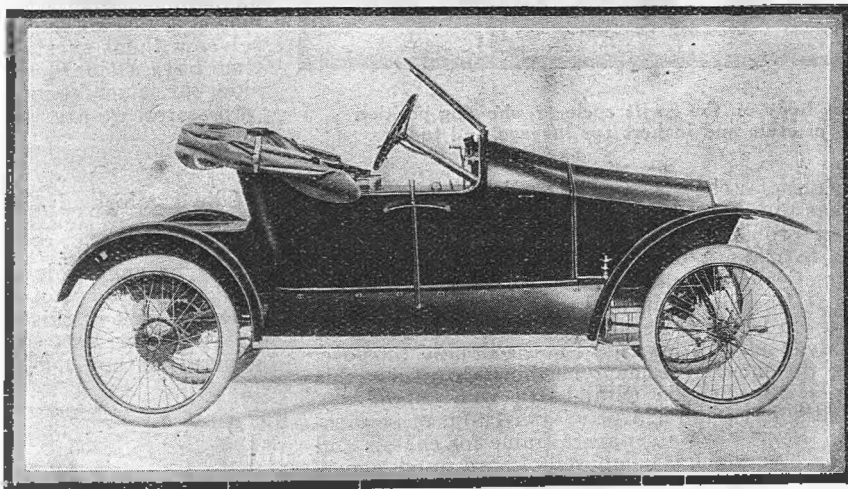


DUO.

- Engine .. 8 h.p. twin-cylinder air-cooled J.A.P., bore 85 mm., stroke 85 mm., large fly-wheel and fan.
- Frame .. Armoured ash.
- Transmission .. Chain to counter-shaft and belts to back wheels.
- Clutch .. By slipping belts.
- Steering .. By wheel and cables working on the Ackerman principle.
- Gear ratios .. 3 1/2-1 to 8-1.
- Tyre sizes .. 26 in. by 2 1/2 in.
- Body details .. Two-seater with scuttle dash.
- Price .. 15s.
- Weight (chassis) .. 4 1/2 cwt.
- Brakes .. Shoe brakes on belt rim.
- Wheels .. Detachable wire.
- Suspension .. Half-ellipticals throughout.

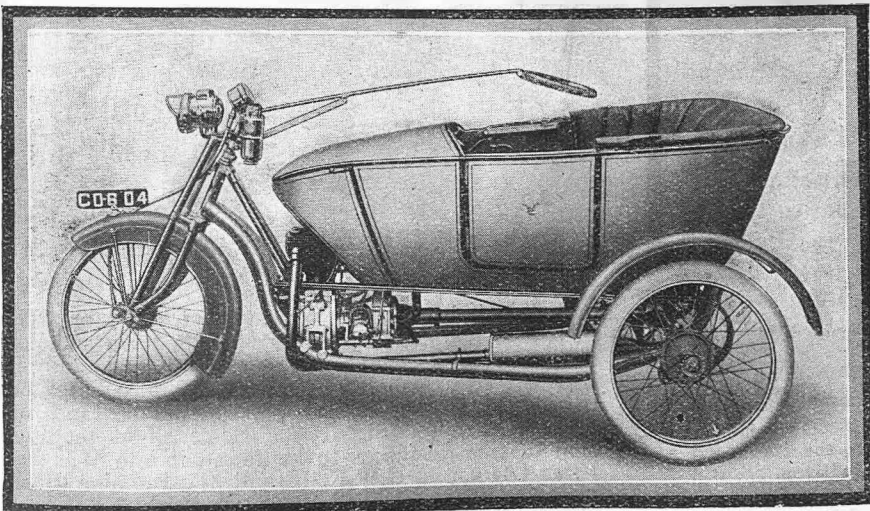
HUMBERETTE.

- Engine .. Twin-cylinder air-cooled Humber, 84 mm. by 90 mm.
- Frame .. Tubular.
- Transmission .. By shaft through gearbox to a bevel-driven live axle.
- Clutch .. Leather-faced cone.
- Steering .. Rack and pinion.
- Gear ratios .. 13.5-1, 8-1, 4.5-1 top.
- Tyre sizes .. 650 mm. by 65 mm.
- Body details .. Two-seater with scuttle dash.
- Price .. £115; with hood, screen and full equipment £125.
- Weight .. 7 cwt.
- Brakes .. Foot brake at rear of gearbox and hand brakes on back wheels.
- Wheels .. Fixed wire.
- Wheelbase .. 7 ft. 3 in.
- Track .. 3 ft. 6 in.
- Springs .. Half-elliptical transverse front, quarter-ellipticals at back.



WALL.

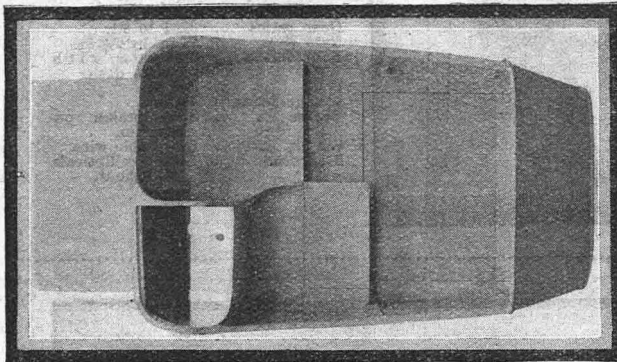
- Engine .. Single (82 by 96 mm.) or twin-cylinder (75 by 85 mm.) air-cooled Precision.
- Frame .. Tubular, of very rigid construction.
- Transmission .. Shaft to differential axle.
- Clutch .. Roc patent.
- Steering .. By long tiller, isolated from road shocks by springs.
- Gear ratios .. 5 1/2-1 and 9-1.
- Tyre sizes .. 26 by 2 1/2 in.
- Body details .. Coachbuilt side-entrance sociable.
- Price .. With single-cylinder engine 90 guineas, with twin-cylinder engine 97 guineas.
- Weight .. 4 1/2 cwt.
- Brakes .. On rear hubs and also on transmission shaft, operated independently.
- Wheels .. Wire detachable.
- Suspension .. Longitudinal flat springs.



THE CYCLECAR OF 1913 (contd.).

Frame and body in one unit—Satisfactory armoured wood frames—Bodywork—Is a door required?—Suspension—The popularity of the semi elliptic spring.

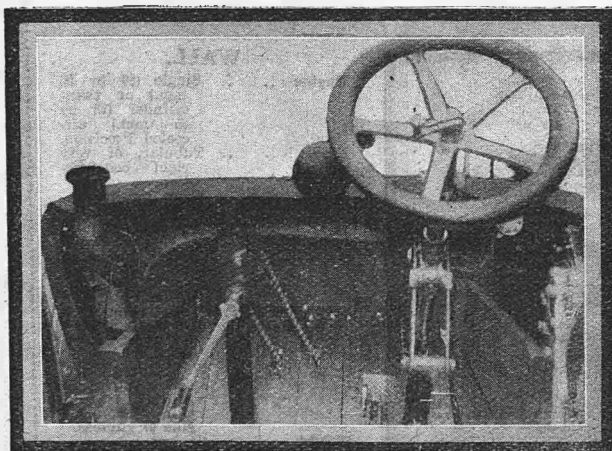
mostly on the higher-priced vehicles. A slight deviation from this method is to be found in the A.-C. (Stand 60), which is the result of much experimenting to obtain a light machine with a maximum of strength. It has a frame of angle steel built into the body, and the chassis is erected on the body instead of the other way about. Naturally, there is no use in keeping



The body on the Swift cyclecar, showing position of seats and lockers for luggage and tools.

the weight of a chassis down to a minimum if a heavy body has to be fitted; consequently, one of the most pressing problems the cyclecar manufacturer has to face is to make a body that is light and which, at the same time, will not shake to pieces.

It is in this direction, perhaps, that the makers of the wooden frame score, for in this case the frame of the body itself can be used for the double purpose. Among the most prominent machines to utilize this principle, the Bedelia (Stand 23), Duo (Stand 33), G.N. (Stand 31), and Warne (Stand 118) may be mentioned. Some have a separate frame for chassis and body, each of which is composed of hard wood, generally ash. There is no doubt that these frames give



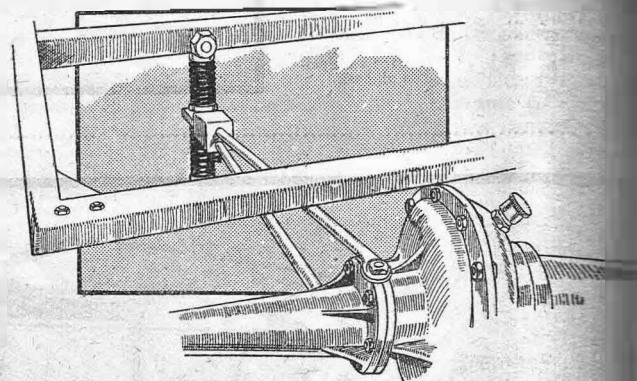
Interior view, looking forward into the dashboard of the Leo cyclecar, which is front driven. It will be seen that it is possible to start the engine from inside the body.

every satisfaction when suitably armoured at the joints; in fact, some of the most popular machines, in addition to those quoted above, namely, the Super (Stand 128), the Arden (Stand 27), the Surridge (Stand 21), and the Kendall (Stand 161) employ this method.

Many people ask, on viewing a cyclecar, especially some of the older types, why no door is provided. This deficiency may be explained thus. A cyclecar body, as has been already explained, must be light, but at the same time have sufficient strength. The introduction of a side door renders the body problem more difficult, for a gap in its side means less rigidity. However, where a door is not provided, the seats are made accessible by fitting a high running board, or by some other means which enables the passengers to seat themselves without exertion. Many bodies at the present time have a side door fitted, sometimes one on each side, the latter being a luxury which few people who own motorcars are able to boast of.

Suspension.

The comfort of the occupants of a cyclecar depends more on the springing arrangement than on any other detail. Not even the most expensive car would be endurable had it springs that were hardly in action. It is not only the passengers that suffer from a defect of this nature, but the whole chassis quickly deteriorated by innumerable road shocks. The general method adopted on most machines appears



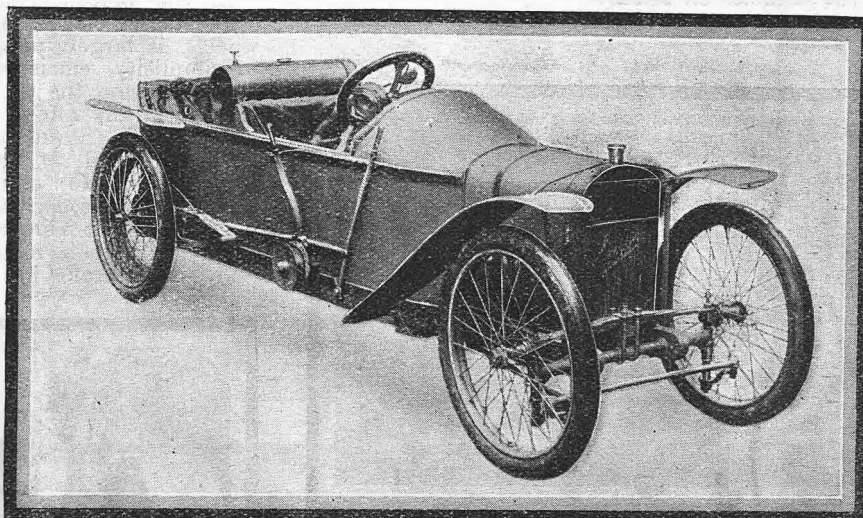
Spring loaded torque rod on Kendall worm-driven cyclecar.

to be semi-elliptical springs in front and rear. This design is simple, and if the springs have sufficient length, it gives very efficient service. Good examples of this type are the Tiny Car (Stand 15), Chater Le Mans (Stand 78), Wilkinson (Stand 22), Kendall (Stand 161) and the Brough (Stand 36). Some slight modification of this design is to be found in the Warnock (Stand 118), the G.W.K. (Stand 34), Premier (Stand 111), and the A.-C. (Stand 60), all of which use semi-elliptical springs in front and quarter-elliptical at the

CYCLECARS AT OLYMPIA.

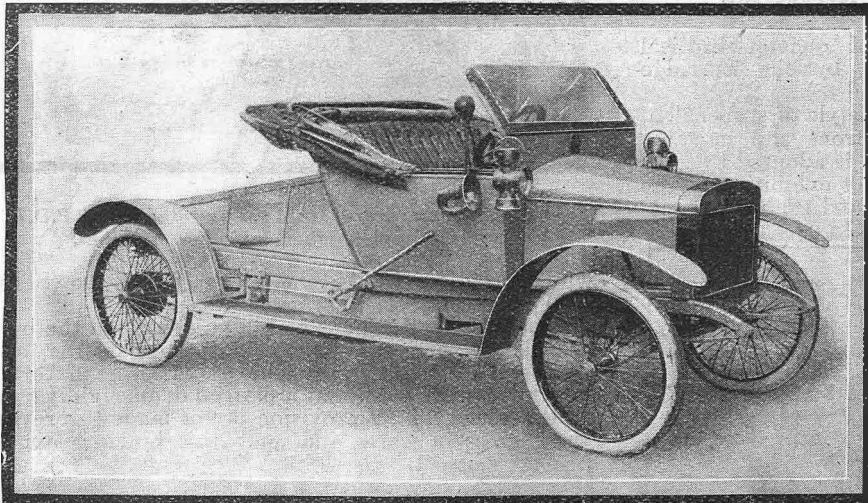
SUPER.

- Engine .. 8-10 h.p. two-cylinder water-cooled Anzani, 75 mm. by 120 mm. or 85 mm. by 85 mm. twin.
- Frame .. Armoured ash strutted with girder stays.
- Transmission .. Chain to counter shaft and belt to back wheels.
- Clutch .. By slipping belts
- Steering .. Worm and sector irreversible.
- Gear ratios .. Ranging from 4-1 to 16-1.
- Tyre sizes .. 650 mm. by 65 mm.
- Body details .. Coach-built steel, with hammock seats.
- Price .. 95 guineas.
- Weight .. 400 lb.
- Brakes .. Foot-operated hand brakes and belt rim brakes.
- Wheels .. Fixed wire
- Ignition .. U.H. magneto, or by accumulator and coil.



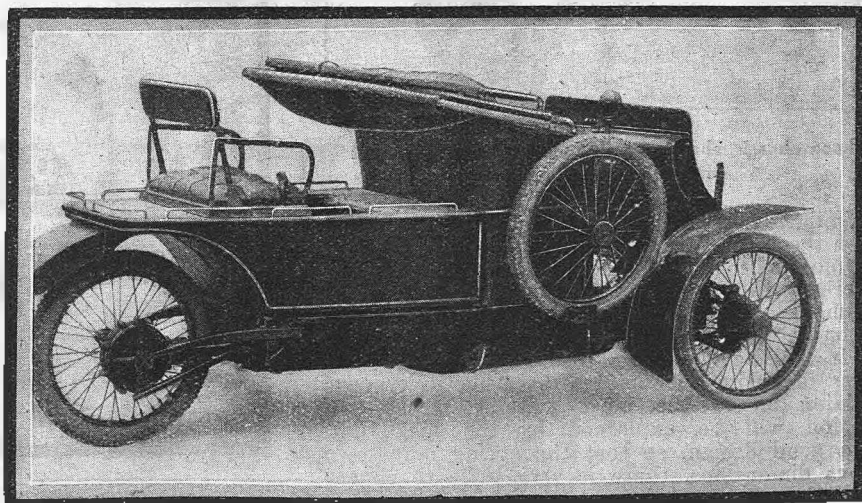
G.W.K.

- Engine .. 8 h.p. two-cylinder water-cooled Coventry - Simplex.
- Frame .. Channel-section pressed steel.
- Transmission .. Through friction discs and propeller shaft to live back axle.
- Clutch .. By separating the friction discs.
- Steering .. By rack and pinion.
- Gear ratios .. 3.9-1, 4.7-1, 6.2-1, and 8-1 forward, also reverse.
- Body details .. Two-seated torpedo with high side doors.
- Price .. £135.
- Tyre sizes .. 650 mm. by 65 mm. on all wheels.
- Brakes .. Internal-expanding on back wheels, foot brake on transmission shaft.
- Wheels .. Fixed wire.
- Cooling .. By gear wheel pump through tubular radiator.



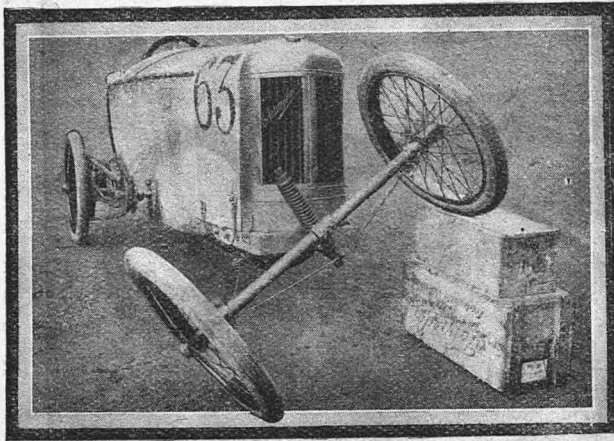
GIRLING.

- Engine .. 6 h.p. single-cylinder, fan cooled, bore 95 mm., stroke 95 mm.
- Lubrication .. Automatic by pump.
- Transmission .. By friction through a cardan shaft to bevel gear on back wheel.
- Clutch .. By moving friction discs apart.
- Steering .. Direct by tiller.
- Gear ratios .. Range from 5-1 to 16-1.
- Body details .. Two-seater, with third extra seat if required.
- Price .. £110, with hood, lamps and tools.
- Brakes .. Internal on back wheel and on cardan shaft.
- Wheels .. Wire, interchangeable and detachable.
- Speeds .. Five forward speeds and a reverse are provided.



THE CYCLECAR OF 1913 (contd.).

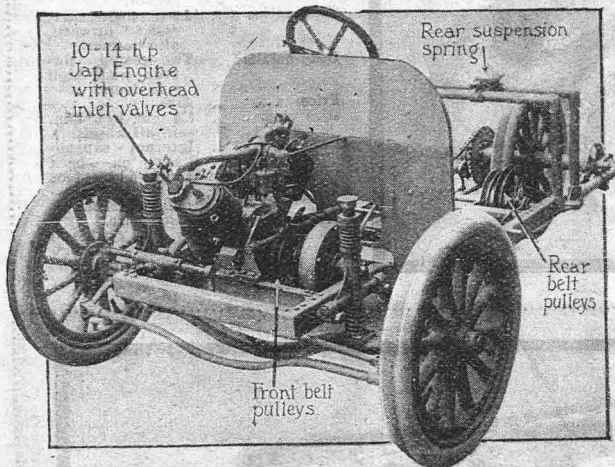
The transverse front spring—Brakework—Cheapness of the belt rim shoe—Other types—Effect of bad weather on brakes.



A remarkable demonstration of the universally-jointed central pivot steering on the Automobilette.

rear, while the arrangement of quarter-elliptical springs throughout is favoured by the Surridge (Stand 21) and the Gordon (Stand 38).

The original Bedelia (Stand 23) style of suspension, by means of a spiral spring in front and movable half-elliptical springs at the back, is adopted by various other makers, but they are not exhibiting at the Show. However, the Morgan (Stand 18) has a some-



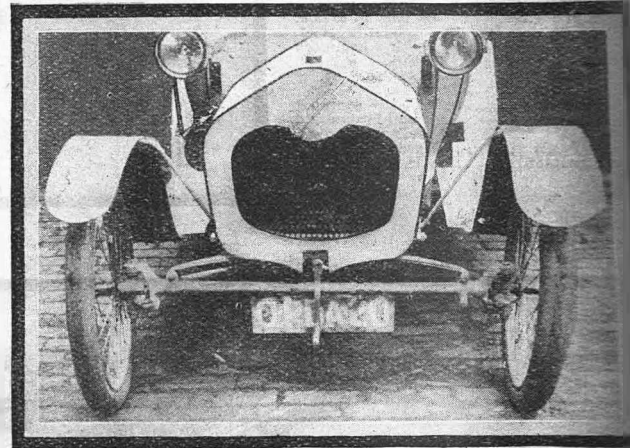
Jackson chassis, showing coiled springs used for front and rear suspension.

what similar design. Two coil springs are interposed between the frame and the stub axles, while the rear axle is mounted on the chassis by quarter elliptics. A transverse spring in front is the method adopted by the Humberette (Stand 52) and the Super (Stand 128), while half-elliptics complete the suspension at the rear. It will be seen that every conceivable combination of springs is employed. This divergence of opinion as to the most suitable method of suspension will be explained by the fact that, given a good design, so that the spring may have generous dimensions, there is very little to choose between the efficiency of any of the various types.

Brakes.

The subject of brakes is a very important one in cyclecar design, and there are several different types applied.

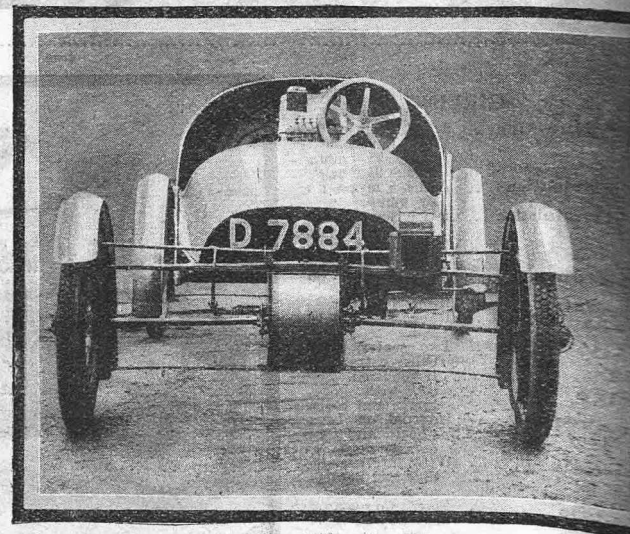
In the belt-driven cyclecar, the internal shoe brake, acting on the inside of the belt rim on the back wheels, is largely used. This brake has the merit of simplicity, efficiency and cheapness. It is easy to adjust, and the presence of mud and water does not materially affect its action. This type is used on the Duo (Stand 33), the G.N. (Stand 31), the Bedelia (Stand 23), the Super (Stand 128), and the L.M. (Stand 115). Another popular brake on this type of machine, having a sliding back axle, is one in which the belt rim is pressed against fixed stops when the axle is moved forward to its fullest extent. This brake has a powerful retarding effect.



The popular transverse front spring fitted to the P.D.A. cyclecar and numbers of other machines.

and is used on the Automobilette, the Rollo (Stand 119) and Duo (Stand 33) machines.

External band brakes acting on drums on the back wheels are very common. This brake takes the form of a steel band lined with some anti-friction material which is contracted about a flanged drum rigidly fixed to the wheel, but if provision is not made to prevent the ingress of water and mud, this brake is apt to become clogged.

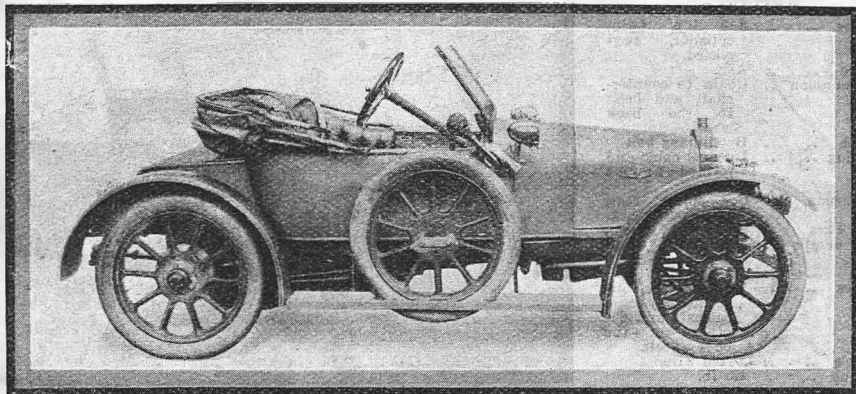


Rear suspension on the Parnacott,

CYCLECARS AT OLYMPIA.

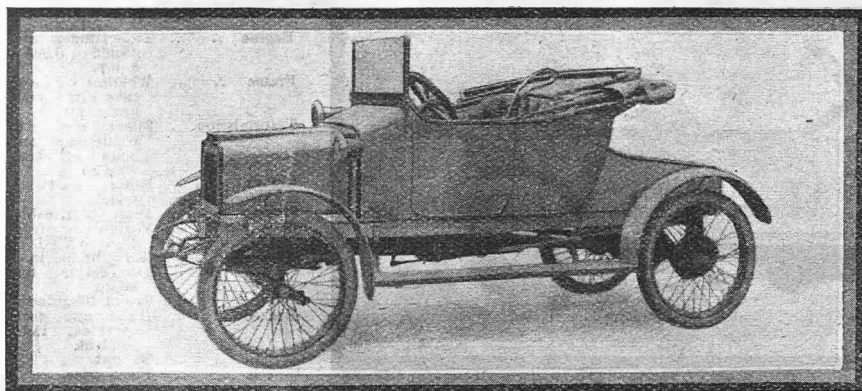
SINGER.

Engine ..	10 h.p. four-cylinder water-cooled, bore 63 mm., stroke 85 mm., 1036 c.c.
Frame ..	Channel steel.
Transmission ..	Cardan shaft to gear-box on axle.
Clutch ..	Leather-faced cone, enclosed type.
Steering ..	Worm and sector.
Gear ratios ..	4½-1, 10-1.
Tyre sizes ..	700 mm. by 80 mm.
Body details ..	Two-seater.
Price ..	£185 complete with hood, screen, lamps, as shown.
Weight ..	Chassis 6 cwt.
Brakes ..	Foot and hand, working independently.
Wheels ..	Sankey detachable, with one spare.



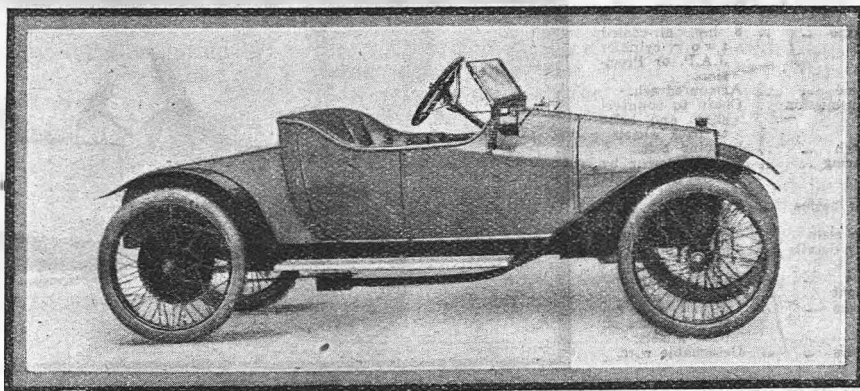
ARDEN.

Engine ..	8 h.p. twin-cylinder air-cooled J.A.P.
Frame ..	Oak with steel fitch plates the entire length.
Transmission ..	Enclosed cardan shaft.
Clutch ..	Leather-to-metal cone internal type.
Steering ..	By wheel and cable.
Gear ratios ..	5-1, 8½-1, 12-1, reverse 15-1.
Tyre sizes ..	700 mm. by 65 mm.
Body details ..	Two-seater, flush-sided torpedo body.
Price ..	110 guineas, hood and screen 7 guineas extra.
Weight ..	6½ cwt. ready for the road.



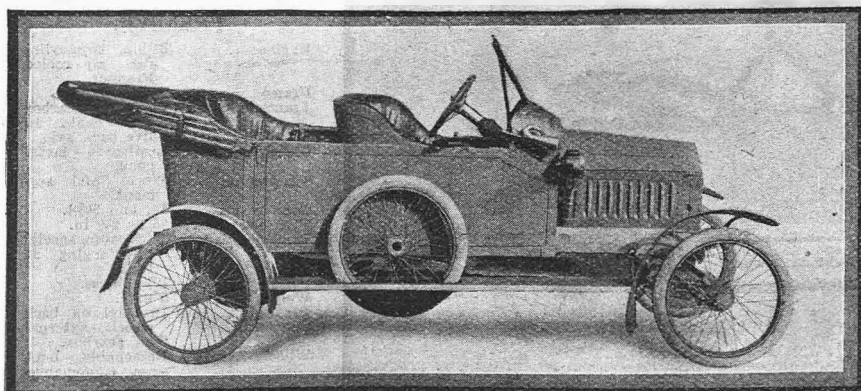
SURRIDGE.

Engine ..	8 h.p. air-cooled Falair.
Frame ..	Ash armoured.
Transmission ..	Friction and chain-drive to one wheel.
Clutch ..	By friction wheels.
Steering ..	Direct by rods, Chater Lea fittings.
Gear ratios ..	4-1, 5-1, 7½-1, 10-1, 16½-1.
Tyre sizes ..	700 mm. by 89 mm.
Body details ..	Two-seater.
Price ..	£170 complete.
Suspension ..	Quarter-elliptical throughout.
Lubrication ..	By hand pump.
Brakes ..	Internal-expanding on back wheels.



GORDON.

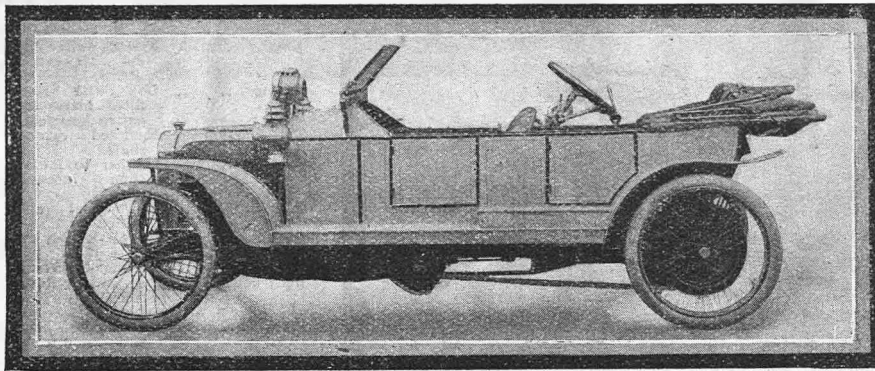
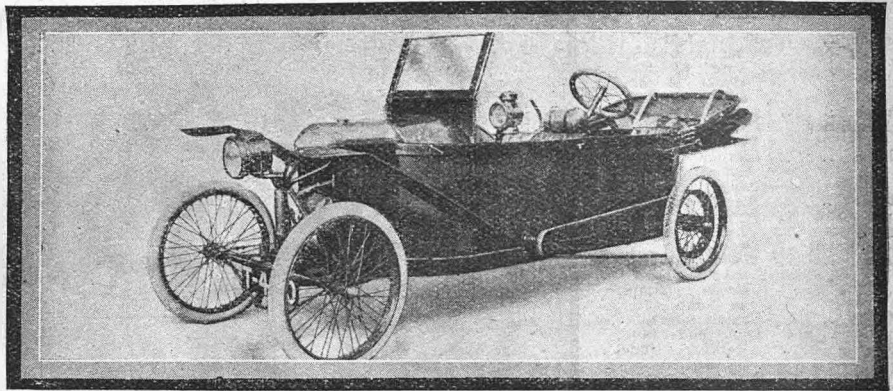
Engine ..	90 J.A.P. twin, 85 mm. by 120 mm.
Frame ..	Steel tubing.
Transmission ..	Chain drive throughout.
Clutch ..	Multiplate.
Steering ..	Direct.
Gearbox ..	Three speeds forward and reverse.
Tyre sizes ..	700 mm. by 85 mm.
Body details ..	Body built up with steel tubing, two or four-seater.
Price ..	£160 four-seater, £135 two-seater.
Springs ..	Quarter-elliptic.
Wheels ..	Wire, on ball bearings.
Dimensions ..	Wheelbase 8 ft., track 3 ft. 8 in.



CYCLECARS AT OLYMPIA.

BEDELIA.

Engine	8-10 h.p. twin-cylinder, air-cooled.
Frame	Ash.
Transmission ..	Chain to countershaft and belts to the back wheels.
Clutch	By slipping belt.
Steering	By steel cable and pivoted front axle.
Suspension	Cee spring rear, and spiral front.
Tyre sizes	650 mm. by 60 mm.
Body details ..	Two-seated tandem torpedo.
Price	103 guineas.
Brakes	Two separate, one acting on countershaft and the other on the back wheels.
Wheels	Fixed wire.
Weight	425 lb.

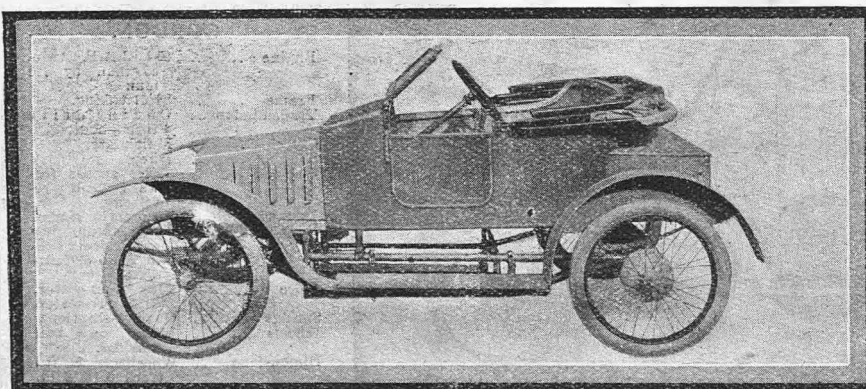
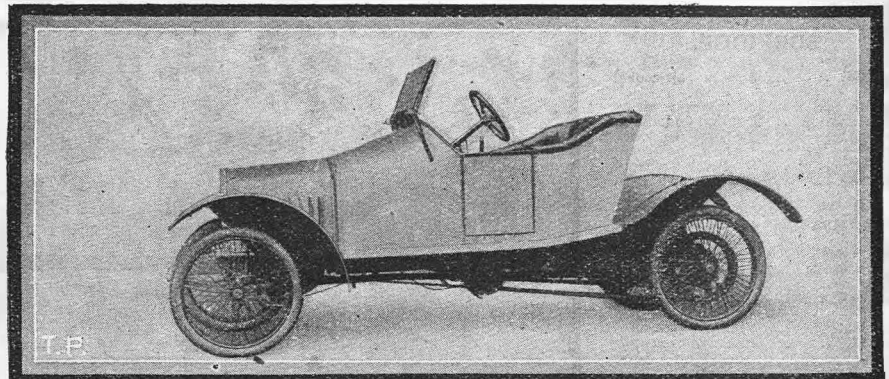


ROLLO.

Engine	Two-cylinder air-cooled J.A.P., 8 h.p.
Frame	Weldless-steel tube with double girder stays.
Transmission ..	Silent chain to countershaft and belts to back wheels.
Clutch	Rollo patent metal.
Steering	Drum and cable.
Gear ratios	Variable from 4½-1 to 7½-1.
Tyre sizes	26 in. by 2½ in.
Body details ..	Two-seater torpedo.
Price	85 and 100 guineas.
Brakes	Hand and foot-operated, independent.
Weight	534 cwt.
Wheels	Fixed wire.

WARNE.

Engine	8 h.p. air-cooled two-cylinder J.A.P. or Precision.
Frame	Armoured ash.
Transmission ..	Chain to countershaft and belts to back wheels.
Clutch	Slipping belt.
Steering	Wheel steering by drum and single cable.
Gear ratios	Variable from 4½-1 to 9-1.
Tyre sizes	26 in. by 2½ in.
Body details ..	Two-seater with scuttle dash.
Price	£99.
Weight	4¾ cwt.
Brakes	Internal and external brakes on back wheels.
Wheels	Detachable wire.



PREMIER.

Engine	8 h.p. twin-cylinder air-cooled Premier.
Frame	Tubular.
Transmission ..	Chain to gearbox and chain to live back axle.
Clutch	Leather-to-metal cone.
Steering	Worm and segment.
Gear ratios	4¾ and 9½-1.
Tyre sizes	26 by 2½ in.
Body details ..	Two-seater, special springing at back.
Price	101 guineas.
Weight	5 cwt.
Brakes	Internal on back wheels, external on gearbox.
Wheels	Detachable, but not interchangeable.

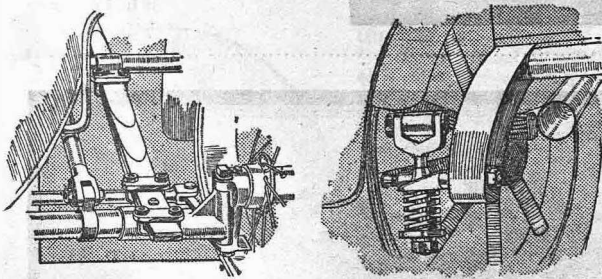
THE CYCLECAR OF 1913 (contd.).

External expanding brakes—Braking on the three wheelers—System still open to improvement—Wheels and tyres—Wire wheels widely used—Larger tyres still required.

The most weatherproof brake is the external-expanding type, in which segments are expanded by a cam against the inner periphery of a drum fixed to the wheels. Chater Lea (Stand 78) make use of these brakes, likewise the Warne cyclecar (Stand 123).

Those machines employing propeller-shaft drive to the back axle are usually provided with a brake acting just behind the gearbox. The Swift (Stand 12) and the G.W.K. have brakes of this description. The Premier (Stand 111) carries a brake on the gearbox and internal-expanding brakes on the back hubs. Internal-expanding brakes will also be found on the Kendall (Stand 161), the Rollo (Stand 119), the G.W.K. (Stand 34) and the Surridge (Stand 21).

Three-wheeled cyclecars are provided with two band brakes on the back wheels, as on the A.-C.



Left—Radius rod and inverted elliptic front spring on new P.M.C. motorette. Right—New spring shock absorber on Singer.

(Stand 60), the Morgan (Stand 18), and the Matchless (Stand 74). Front-wheel brakes can, however, be provided on the A.-C. at an extra cost.

In the Bedelia (Stand 23) a brake is provided on the countershaft, and the application of this brake also causes the exhaust valves to be raised, while the Autotrix (Stand 47) is provided with front-wheel brakes as standard.

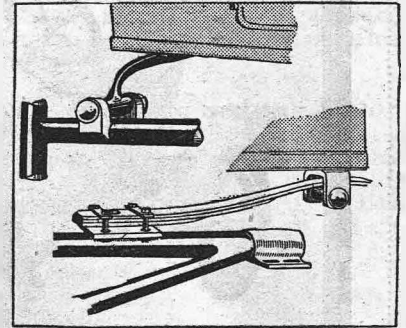
The general impression left after this detailed survey of cyclecar brakes is that much can still be done in the way of improvement. The sizes can be largely increased, and more workmanlike fittings provided.

Wheels and Tyres.

The wheels fitted to cyclecars are of three types, the wire suspension, the wooden artillery, and the pressed steel wheels. The wire wheel, however, is practically universal, and we naturally look to Rudge-Whitworth, Ltd., the wire-wheel specialists, for the latest examples of this type. It will be noticed that the Rudge wheel has a wide hub, with a special cup-shaped flange to take the spoke heads. The front wheels are widely splayed, and they look very strong.

The cyclecars which are not fitted with wire wheels are the Singer (Stand 79) and the Girling (Stand 110), which are both equipped with pressed-steel detachable wheels. The Crouch carette is fitted with ordinary wooden artillery wheels

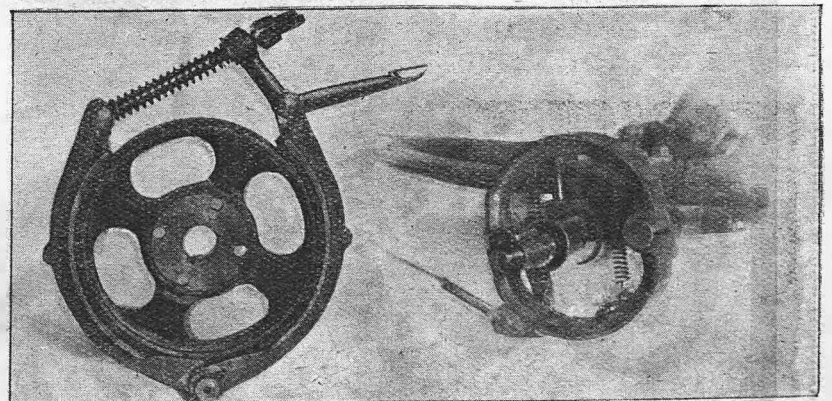
The tyres fitted are 26 in. by 2½ in., or the equivalent millimetre sizes, 650 mm. by 65 mm. In the three-wheeled cyclecars, it is interesting to note the size of tyres fitted to the back wheels, as a single wheel has to sustain the driving and braking stresses. The A.-C. (Stand 60) has 2½-in. tyres to all three wheels,



Method of springing the body on the tubular chassis of the Premier cyclecar. The upper sketch shows the supporting arm and lug at fore end of body. The lower sketch shows the rear springing and the slotted end of chassis to facilitate chain adjustment.

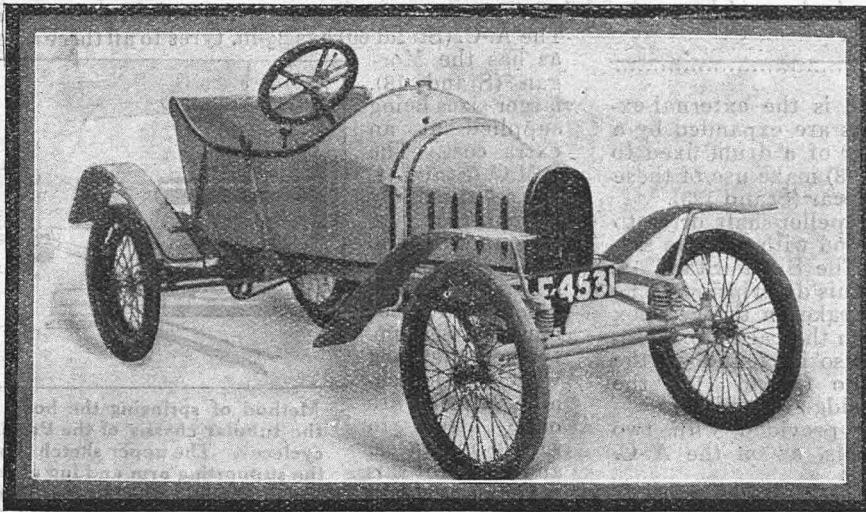
as has the Morgan (Stand 18), larger sizes being supplied at an extra cost. The P.M.C. (Stand 78) has a 700 mm. by 80 mm. rear tyre as standard, and the Matchless (Stand 74) is provided with a 700 mm. by 85 mm. tyre on the back wheel. Detachable wheels are only fitted in rare instances, and no doubt this refinement will come with time. In machines employing belt drive as the final transmission, the presence of the belt rim complicates the problem, as it will be necessary to provide a belt rim on the spare wheel. This difficulty could be overcome by spoking the belt rim separately to the fixed hub; a parallel case is the belt rim on free-engine motor-bicycles. In the Girling (Stand 110) all three wheels are interchangeable, the rear wheel being detached in an ingenious way. One nut is unfastened and the wheel and axle are swung away from the spring. The wheel may then be easily detached from the fixed hub.

Larger tyres would be of advantage throughout, but the cost of tyres represents such a large item in the price of the cyclecar, that the makers are hampered in providing what would give the best results. However, as soon as the demand for larger tyres makes itself felt, the makers will supply the demand. Several manufacturers have brought out tyres specially designed for cyclecars, and these are made similar in all respects to the larger car types. One of the points which will do more to popularize the cyclecar than anything else will be the extraordinary mileage that the user will be able to get from his tyres. This is due to many causes, the principal one, however, being the even distribution of weight.



Examples of brakework. Left—External contracting brake showing thumb-screw adjustment. Right—Internal expanding shoe, the drum being omitted for clearness sake.

CYCLECARS AT OLYMPIA.

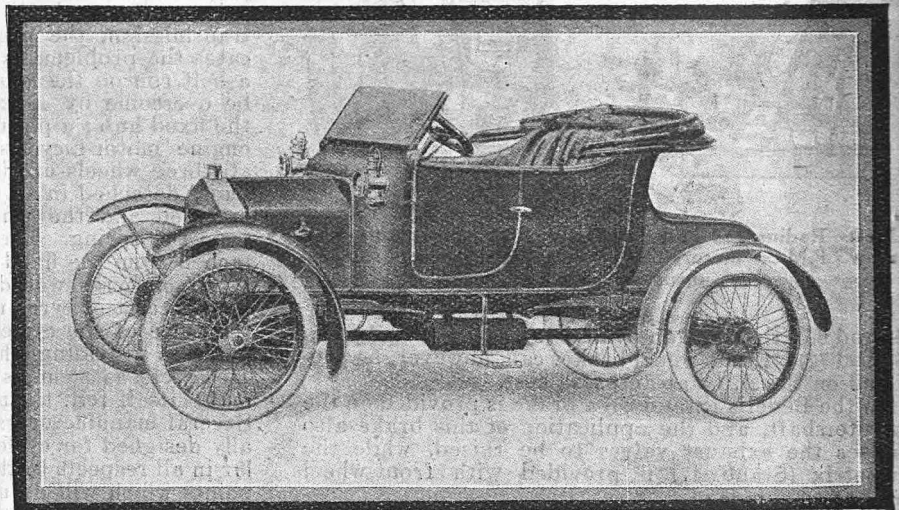


L.M.

Engine	8 h.p. twin-cylinder air-cooled J.A.P., bore 85 mm., stroke 85 mm.
Frame	Steel tubing.
Transmission ..	By chain to dog-clutch gearbox, and thence to live axle.
Clutch	Disc, metal-to-metal.
Steering	Wheel, 16 in. diameter.
Gear	Two forward speeds, 4/5 and 10/4 to 1.
Tyre sizes	26 in. by 2 1/4 in.
Body details ..	Two-seater torpedo body.
Price	45 guineas.
Weight	Approx. 5 cwt.
Brakes	Countershaft brake and rim brakes on back wheels.
Springs	Of special design in combination with chassis.
Dimensions ..	Overall length 10 ft. 3 in., width 3 ft. 8 in.

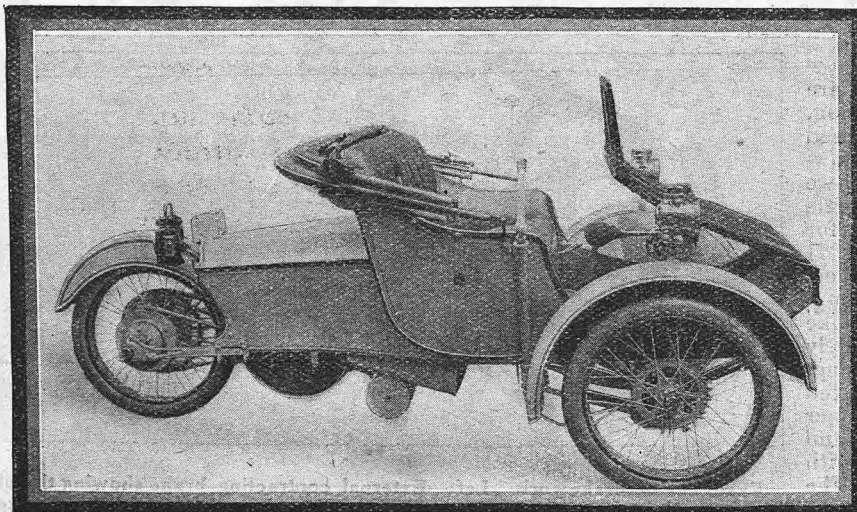
ALLDAYS.

Engine	Single-cylinder, 8 h.p., water-cooled, 4 in. by 4 1/2 in.
Frame	Channel-section steel.
Transmission ..	Through gearbox and cardan shaft to worm-driven back axle.
Clutch	Leather-to-metal cone.
Steering	By wheel.
Gear	Three speeds forward and one reverse.
Tyre sizes	650 mm. by 65 mm.
Body details ..	Two-seater victoria with high side doors.
Price	4130.
Lubrication ..	By mechanical pump, driven off camshaft.
Brakes	Internal brakes on back wheels, external brake on propeller shaft.
Wheels	Fixed wire.
Springs	Inverted half-elliptical.



A.C.

Engine	5-6 h.p. A.C. air-cooled, bore 95 mm., stroke 102 mm.
Frame	Combination of ash and steel.
Transmission ..	Chain.
Clutch	Incorporated with epicyclic gears of the multiple-disc type.
Steering	Tiller.
Gear	Epicyclic, ratios 4 1/2:1, 9:1.
Tyre sizes	650 mm. by 65 mm.
Body details ..	Two or three-seater, coach finish.
Price	£32 10s.
Weight	4 cwt.
Brakes	Two on back wheel, front wheel brakes £23s. extra.
Springs	Quarter-elliptical in rear, semi-elliptical in front.
Lubrication ..	Automatic from a reservoir in crankcase.



PERSONAL GOSSIP. The Two Secretaries of the Cyclecar Club. :: An Interview with the Designer of the Bedelia.

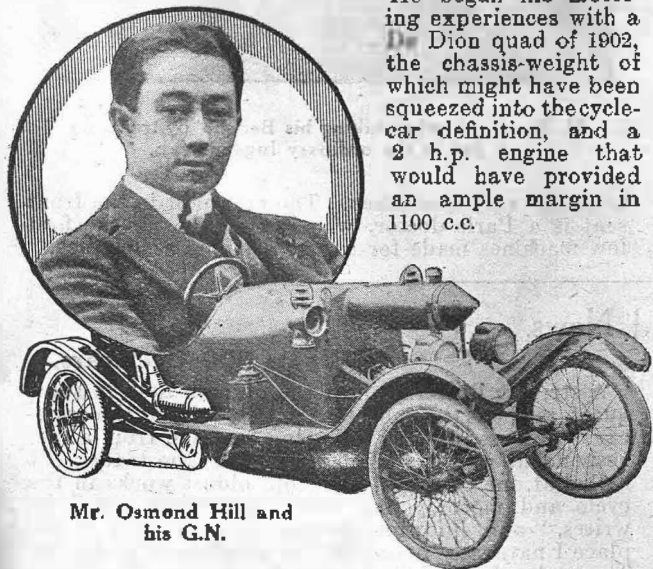
The "Hippopo-Thomas" and Its Driver.

NO—this is not an excursion into zoology by Dr. Low, a versatile genius who must be pilloried later. "Hippopo-Thomas" has four wheels, not legs, a big and very willing heart (at times), a caudal appendage of a kind, and not much else in common with the mammalian world.

It is, in short, the big G.N.—for it has an engine outside the cubical capacity of an arbitrary definition—owned by one Frank Thomas, joint honorary secretary of the newly-formed Cyclecar Club, who is known to the cognoscenti of the motorcycle world as "G.O.K." Thomas.

A worker, quiet, unassuming, with a genial temperament not to be ruffled by such trifles as broken big-ends in the middle of Salisbury Plain, or belt repairs on a pitch dark night in the pouring rain—he makes an ideal secretary for a newly-formed organization.

He began his motor-ing experiences with a Dion quad of 1902, the chassis-weight of which might have been squeezed into the cyclecar definition, and a 2 h.p. engine that would have provided an ample margin in 1100 c.c.



Mr. Osmond Hill and his G.N.

"'Hippopo-Thomas' has only pulled me about the country on pleasure trips so far," says its owner, "but at Christmas we shall enter the competition world once more, where the 'G.O.K.' and I had such jolly times. We once won a hill-climb, but my friends were so highly amused that I stuck to reliability runs after that."

Mr. Thomas has been through most of the big open trials, as well as many competitions promoted by the North-west London M.C.C., of which club he was appointed vice-captain this season, after serving some years on the committee.

He has very decided views on the value of wood frames, after being charged by a lady car-driver who trod on the accelerator pedal and threw her arms up in the air as a novel method of avoiding a collision. His opinion of lady drivers, like the frame of his cyclecar after the impact, might be expected to be a trifle warped.



Mr. Frank Thomas.

"But there," he says, "with a steel chassis I should have been smashed to bits, but with a wood frame it was an easy matter to straighten it out"—and so no doubt he took an equally kindly view of the feminine motorist. Anyway, we cannot imagine him otherwise.

Music and the Motor.

THE other joint hon. secretary of the Cyclecar Club, sedate and somewhat reserved, is a very different personality to the lively and debonair "O.S." Hill, driving a big G.N. on the open road or convulsing his fellow clubmen with his whimsical piano accompaniments at club concerts. For his prowess at the

piano is not less than at the wheel. To some extent he shares his fellow secretary's artistic tastes, and the pair as singer and accompanist are valuable assets any dull winter evening. The two secretaries apparently have kindred tastes. Both drive G.N.'s, both live in Hampstead, and the respective seats of their daily labours are within but a stone's-throw of each other. Add to this the fact that both have been leading lights in the North-west London M.C.C., and are amateurs in the strictest sense of the word, and it will be easily understood that it would have been difficult to select two men better suited to carrying out the work of the new club.



M. Bourbeau, photographed at Brooklands lately.

Designed the Bedelia.

IT was on the occasion of the October Brooklands Meeting of the B.M.C.R.C. that we renewed our acquaintance with M. Robert Bourbeau, the designer of the "Bedelia," the pioneer cyclecar. In fact, it was the introduction of the Bedelia that has led to the present boom.

M. Bourbeau is a tall, fair Frenchman, with a



The very first Bedelia, from the first photograph taken of it, which was first reproduced in "The Motor," in 1910. M. Bourbeau is driving.

PERSONAL GOSSIP (contd.).

typical yellow moustache and beard, and a clear complexion. We asked him what he thought of Brooklands track, for he had just finished an hour's cyclecar race in which he had been well placed. He replied in perfect English that he had learnt much by his hour speed trial. The racing on our track was far different to any road work he had done before. He said that the engine had overheated considerably to begin with owing to the different conditions, but after the first lap or two, when he had realized the peculiarities of the track, it ran well. "I should have been more comfortable with a passenger," he said, "but when I come over again I shall know what to do." "What are your plans for next year?" we asked. "We are going in for great simplicity. Direct drive from the engine to the back wheel, as on the racing Bedelia that I drove at Gaillon."

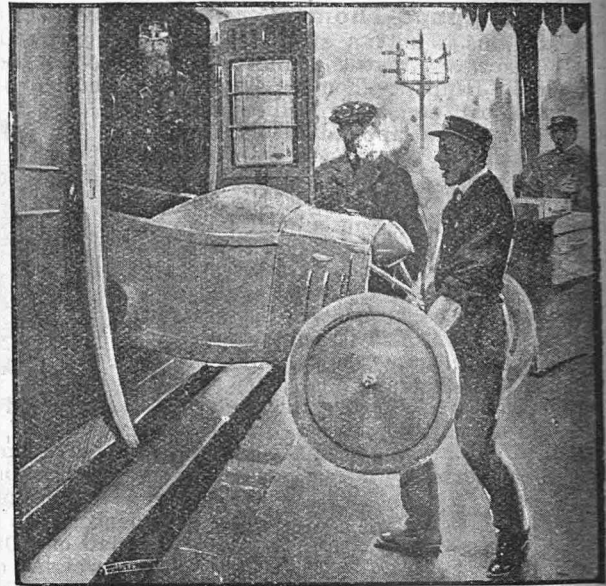
"You used $\frac{3}{4}$ in. belts then, did you not?" and we understood his answer to be in the affirmative. "Are you not a great believer in the simple cyclecar, M. Bourbeau?" we asked. "Yes," he replied, "for the qualities of lightness and simplicity are essential. Do you know, when I came over to England I brought my Bedelia in the guard's-van. That is one of the points in which a narrow, genuine cyclecar scores." We agreed that it was, though the incident seemed to us rather a remarkable one. We asked M. Bourbeau how he came to design the Bedelia, and he merrily confessed that the machine was not designed but grew.

He does not believe in the single-seater, though, of course, on the Bedelia it is an easy matter to convert the machine into a single-seater by covering up the front seat. What is more, the machine is equally well balanced in this position.

It may interest our readers to know that the Bedelia, which in this country is pronounced "Bee-

dee-lia," is properly, and in France, pronounced "Bedelia," with the accent on the second syllable.

The photograph of the first Bedelia, reproduced on the previous page, is of more than ordinary interest.



M. Bourbeau when taking his Bedelia by train has it put in the ordinary luggage-van.

being the very first taken. The occupant in the front seat is a Paris doctor, who bought one of the first few machines made for use as a motor ambulance.

Notes and News.

Cyclecars for Business Purposes.

Many cyclecars are used in France for business purposes. We know of numerous instances where a tandem two-seater is equipped so that the forward portion shall receive samples and luggage, the rear seat being left permanently in position for the driver. Such a combination is decidedly faster than the horse and trap so commonly employed, and, on a mileage basis, no doubt it costs less.

There are no restrictions, either in Paris or any other town, against leaving a motor vehicle unattended in the streets, providing the engine is stopped.



A CYCLECAR AT SPEED.

A40

The Bedelia in the Grand Prix Race.

Wants 500 Cyclecars.

A striking illustration of the opinion held in some quarters about the enormous possibilities of the cyclecar is provided by the following message from a correspondent who is well in touch with the trade: "I called at one of the biggest and oldest works in the cycle and motorcycling trade the other day," he writes, "and, knowing the enormous capacity of the place I naturally broached the question of cyclecars. The reply of my cicerone was convincing: That they are full up with orders for months ahead, but they will be in the cyclecar trade in 1914. They know that there is a brilliant future for this new development, for one Colonial manufacturer not many days ago said, 'I will sell 500 for you next year if you can let me have them.'"

Our Front Cover.

The front cover of THE CYCLECAR will be varied week by week, an effective method of bringing home to thousands the novelty and attractiveness of the new motoring. Different makes of machines will be illustrated. This week's picture depicts a fleet of Duos.

The Leading Motor Journal.

"The Motor" is now the leading automobile journal. Write for a specimen copy (7-15, Rosebery Avenue, London, E.C.). The Show report number now quite out of print, was the biggest weekly journal ever issued, containing 440 pages of text and advertisements.

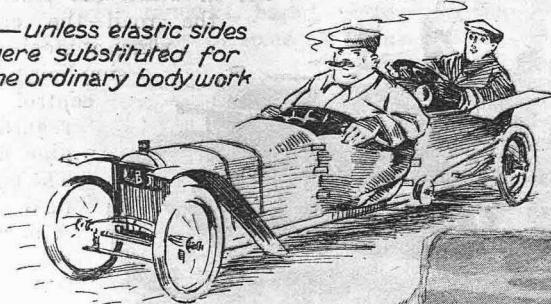
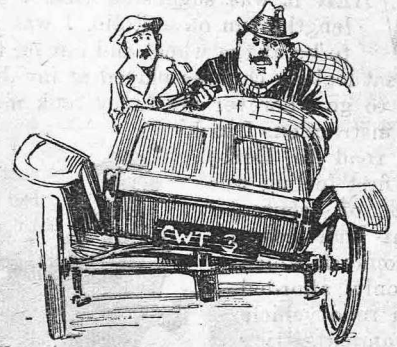
JOY RIDES—SOME SUGGESTIONS.

This would prove expensive —

This also might prove trying



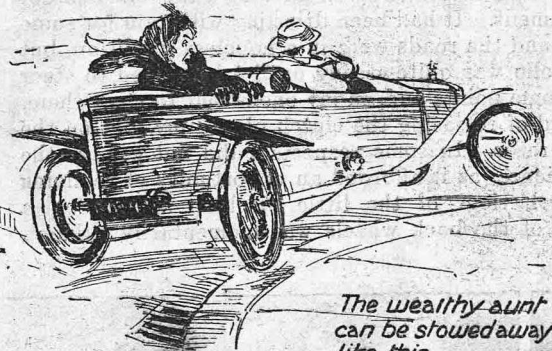
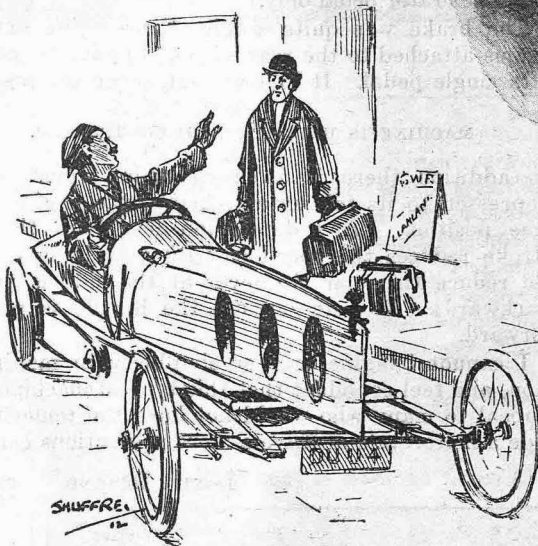
— unless elastic sides were substituted for the ordinary bodywork



For the luggage fiend, the streamline body solves the matter



A roomy body is not always necessary



The wealthy aunt can be slowed away like this.

SHUFFRE

Different types of bodies have their appropriate uses, naturally.

THE LADY DRIVES.

Miss L. Berend, a Well-known Competitor in Motorcycling Events, Gives Her Impressions of Cyclecar Driving.

WHEN it was suggested that I should have a lengthy run on a Rollo, I was all excitement to be at the wheel and out on the open road. A neat-looking car was placed at my disposal for the day to go wherever my fancy took me, and after a few instructions I took the road to Derby. My first feeling was that of contentment that comes of comfort, which is only afforded in a road vehicle by ample sitting room and admirable spring mounting. In these respects the Rollo compared favourably with the big and more pretentious motorcar, as well as the humble sidecar machine.

It was thought advisable that I should be a passenger until the streets of Birmingham had been left behind; in the meantime I had ample opportunity of receiving impressions and examining various details of the construction of the machine. What appealed to me in particular was

ITS SMOOTH RUNNING, EXTREME SILENCE,

and the ease with which it was controlled. At first I was loth to give up the passenger seat and take the wheel, but soon found that the driving seat was as comfortable as the front position, and after a few words of advice we were off again and soon spinning along at well above the legal limit.

The tramlines at Burton gave us a few moments of excitement. It had been drizzling with rain for some time, and the roads were in a hopeless condition, but the Rollo was quite steady until I happened to steer into some points and, in my endeavour to clear them, instead of releasing the clutch placed my foot on the accelerator. In some respects I did not grudge the experience, as it afforded an opportunity of realizing the behaviour of the little machine in grease: a swing of the back wheels was momentarily evident,

but as quickly the machine regained its normal course. The fact that, with a driver of so little experience in manipulating this type of vehicle, no untoward incident occurred should go far to reassure the nervous.

The essential factor which appealed to me, and will no doubt apply to other women, was the sense of security afforded by the manner in which the machine held the road—the ease with which it steered and the simplicity of the control both as

regards the engine and gear. The engine was fed by an A m a c carburetter of the ordinary type with the addition of a foot accelerator. When starting, the air lever of

the ordinary control is closed and the throttle lever opened. The engine is cranked over by a handle on the countershaft and, being geared up, fires with wonderful facility, one pull up over compression being sufficient. The air lever is advanced to the fully open position and the throttle lever just sufficiently to keep the engine turning over. When driving, control is by the accelerator pedal only.

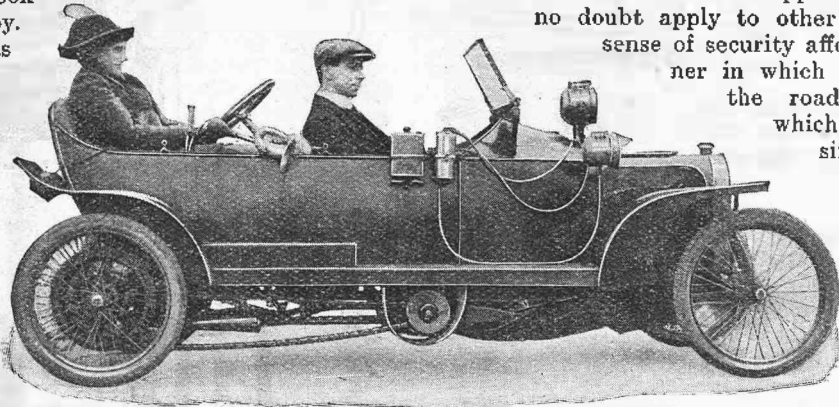
The brake was quite ample, there being outside drums attached to the rear wheels, applied by means of a single pedal. It follows that, when driving, the

MACHINE IS ENTIRELY FOOT-CONTROLLED.

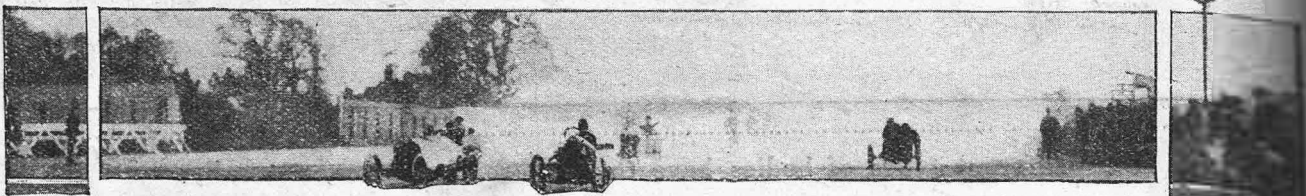
In addition there is a clutch pedal which, when depressed to its full extent, brings the engine to a free position. Any depression less than the full stroke reduces the speed as with a slipping clutch. To reduce the gear the lever at the side is pulled backwards. If changing up, the handle is pushed forward.

I cannot imagine greater simplicity in manipulation, and feel confident that this type of machine will appeal to many who would not have the temerity to ride a motorcycle or drive a more pretentious car.

LOTTIE BEREND.



Miss L. Berend takes the steering wheel of a tandem-seated Rollo, her first experience in driving which she relates on this page.



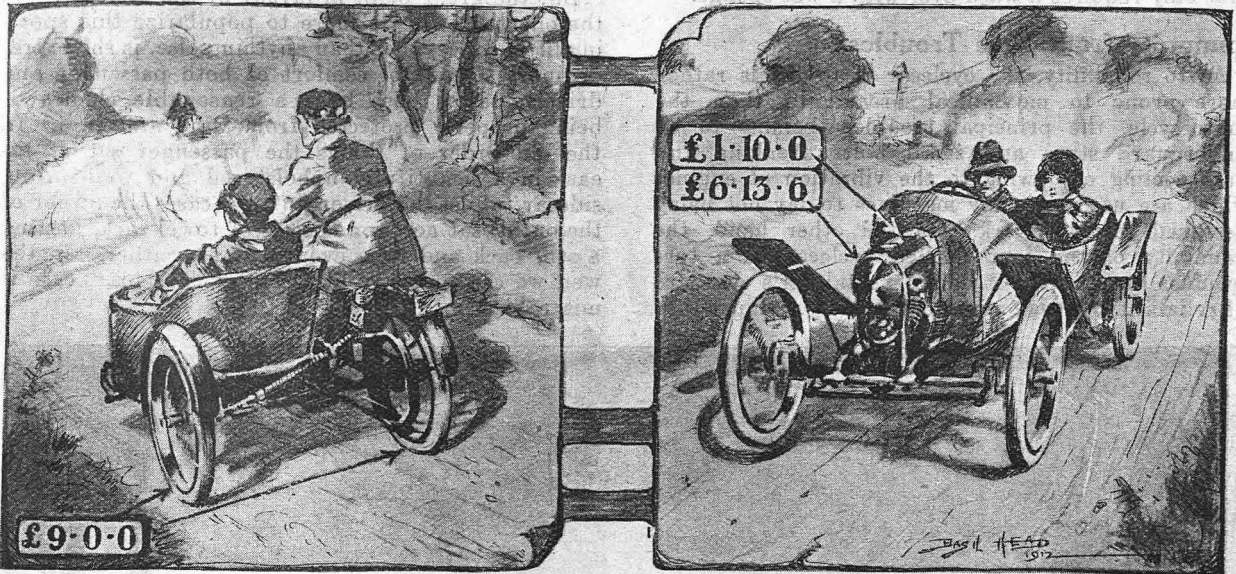
THE SIDECAR AND CYCLECAR COMPARED.

The Running Costs, Advantages and Disadvantages of Each Type Analysed by a Writer who has Had Considerable Experience of Both.

BY FRANK THOMAS.

HERE will be such a bewildering number of cyclecars on the market by January, 1913, and so little real running experience upon which to go, that the prospective purchaser of a powerful passenger motorcycle may well be perplexed as to which type of machine would serve his purposes better—the twin motorcycle and sidecar, or the cyclecar. The following remarks, based on ten months cyclecar driving, may be of some assistance. Run-

The item "belts" on the cyclecar side is only estimated, as, alas! belts have cost me much more than the amount stated, though I believe this should have been a good deal less than the £3 shown under this heading. I have three times completely lost my belt, because the transmission is hidden from view, and when one belt breaks the other drives perfectly, and the loss is not noticed—an advantage easily, in this sense, a disadvantage. At first I attributed the



SIDECAR AND CYCLECAR COMPARED

Tyres are the chief item of expense in the case of the sidecar combination, while, owing possibly to inefficient transmission, the writer finds petrol is the most expensive with the cyclecar.

ning cost will probably be the first consideration. For this purpose we can eliminate the single-cylinder motorcycle and sidecar, as I fear that no present-day cyclecar, for two people, could hope to compete with this extremely economical vehicle. The machines compared below are an 8 h.p., two-speed twin with sidecar and a four-wheeled, air-cooled twin cyclecar with belt drive throughout. This transmission has run 4000 miles this season. The sidecar costs are taken over an average for three years running. Looked at on paper some of the items seem heavy, but they are approximately correct for a high-powered machine that is made to "move."

loss to the ends pulling through, but on one occasion, when a friend salvaged my fugitive transmission, it was found that the fastener had broken. I have since experimented with several patterns of fastener; and find that the ordinary motorcycle type is not up to the work. The only one that has given me entire satisfaction is the Star, which is of the non-detachable pattern.

I still have one of the original belts on the machine, and it is on the condition of this that I have based the estimate of transmission cost. Two of the original tyres on the cyclecar are still in use and are good for a considerable mileage; so that allowing 25s. per annum for overalls (which are not needed on the car), the cyclecar is cheaper to run than the sidecar machine. Also, there is a likelihood of the sidecar being taxed the same as the car in the near future.

Now as to garage accommodation. The owner who has to look closely into his motoring expenses will probably go to some trouble to find an

A43

SIDECAR.		CYCLECAR.	
	£ s. d.		£ s. d.
Petrol (60 m.p.g.)	5 0 0	45 m.p.g.	6 13 6
Oil (750 m.p.g.)	1 4 6	600 m.p.g.	1 10 0
Tyres	9 0 0		4 15 0
Belts	2 10 0		3 0 0
Tax	1 0 0		3 3 0
Total	18 14 6		19 1 6

SIDECAR AND CYCLOCAR COMPARED (contd.).

inexpensive lodging for his machine. A search round a local mews will generally reveal an odd stable or harness room, too small for anything else, which would comfortably accommodate a cyclocar, the rent asked being usually 1s. 6d. or 2s. per week. If the entrance to one's own garden is wide enough to allow the car to pass through, a small garage could be constructed for a couple of pounds, but there must be a suitable spot close by for washing the car down. While on the subject of cleaning, it would not be inopportune to put in another good word for the cyclocar, for it can be rendered spick and span in a third of the time that it takes to clean the motorcycle and sidecar. The crankcase is, as a rule, difficult to get at to clean properly, but this is the only exposed part that gives any trouble. The underscreen and body present a smooth surface that only requires a wash over with a wet sponge.

Immunity from Tyre Troubles.

As to reliability, the cyclocar of to-day is rather more prone to mechanical breakdown than the motorcycle, the principal troubles seeming to be underguard stays and small bolts breaking and nuts coming off, owing to the vibration of engines which are used on many machines to-day not being designed for the work. On the other hand, the immunity of the four-wheeled cyclocar from tyre troubles quite brings it up to the sidecar's standard of reliability. It is only in the nature of things that

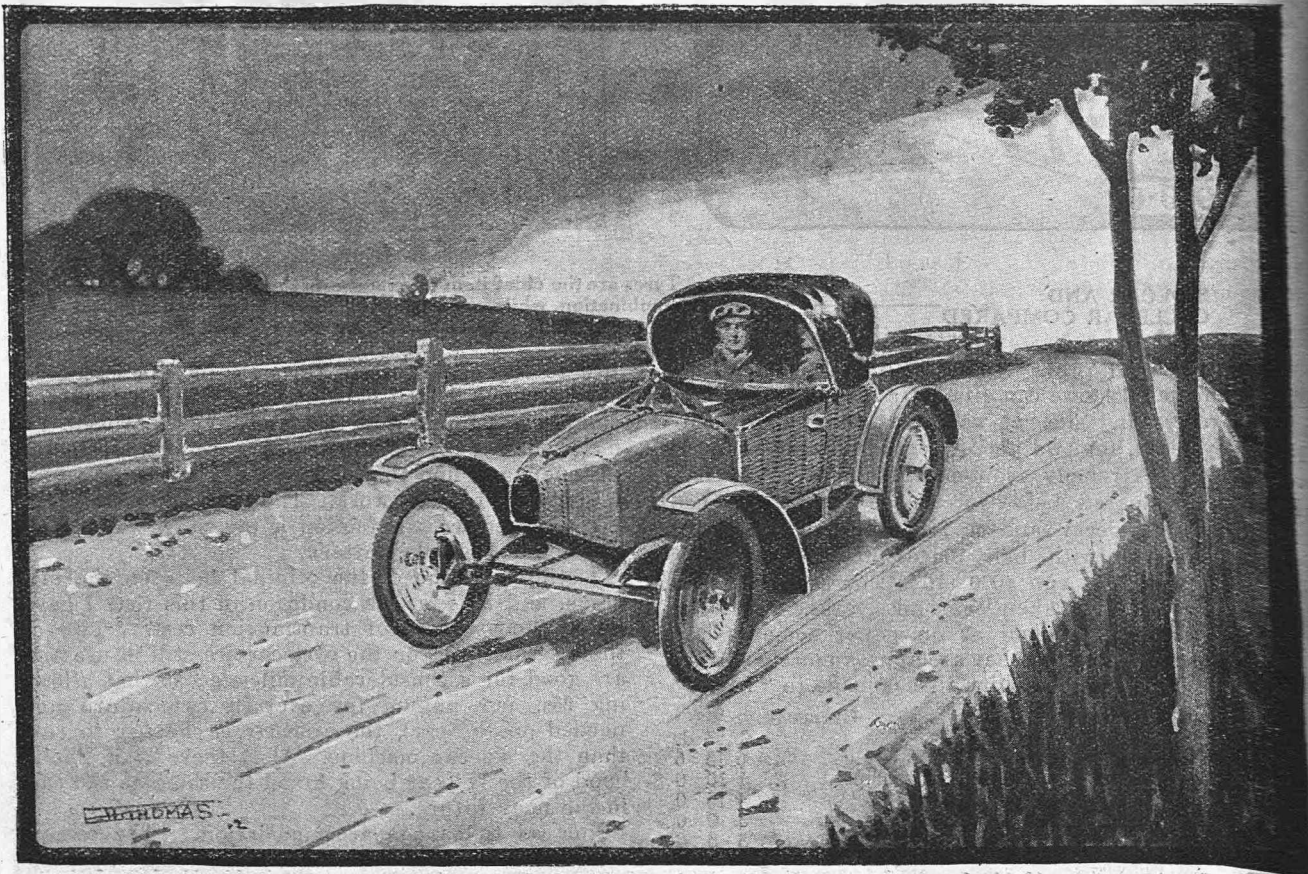
tyre troubles should almost vanish on a type of machine the wheels of which are accessible. A tube can be changed and the tyre pumped up hard again, in three minutes, every time. There is always room for a good-sized pump on the car; by the way, this is a boon that requires no extolling from my pen, to a man who has brought a 26 in. by 2½ in. tyre from flat to board hard with a bicycle pump.

On the road the cyclocar quite holds its own for speed as compared with the average sidecar, and on a snaky course can leave anything on three or four wheels behind it.

The double belt drive and reel of cotton steering, as fitted to many cyclocars, are perfect, and manufacturers need not go to the expense of making those potential sources of trouble—differential gears and big-car-type geared steering.

The Question of Comfort.

But the great point in favour of the cyclocar, and the one that will do more to popularize this sporting little conveyance than anything else, is the extraordinary degree of comfort of both passenger and driver. Now both have a reasonable chance of being properly protected from wind and rain. In the old order of things the passenger sat at his ease in a beautifully upholstered and well-sprung sidecar, whilst the driver (in most cases the owner of the outfit) sat across a species of towel-rack, getting a stiff back and legs, even in fine weather. In the wet, we can only say like Shakespeare his "case is miserable."



**SIMPLE
AND LIGHT.**

**Tubular frame, basket-work body, with
collapsible hood and waterproof windscreen.**

THOUGHTS & OPINIONS

*The Suggestions
of To-day may be the
Realities of To-morrow*

Home-made Cyclecars.

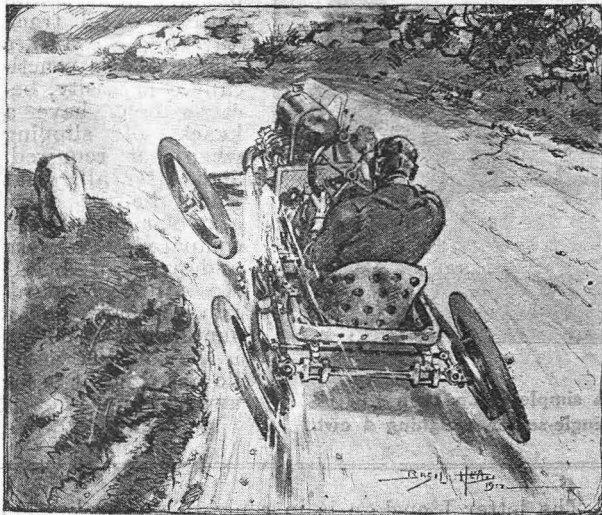
Having noticed the description of several privately-built cyclecars in the motor papers, and other journals, please let me suggest that it would make very interesting reading if correspondents who send photographs would give details as to where they get the different parts, how to put them together, and their cost. I am sure that there are a great many more like myself who would and could spend their spare time and money in following their lead, and would also feel proud of having built their own machines.

Liverpool.

G. WOOLER.

Ingenious, But—

Is it not possible to have the power for the cyclecar derived from two separate engines, purely of the cycle type (500 c.c. or larger), one at each side of the frame, in front, with belt drive direct to their respective back wheels? This arrangement would eliminate a differential altogether, and the drive could be entirely enclosed and made variable by expanding pulleys, or similar device. A reverse could be arranged to come in, and who can tell but



**INGENIOUS
BUT—**

Oscillating wheels for taking corners. A similar idea was actually embodied in a pedal tricycle many years ago.

that we might soon have the engines governed to a set number of revolutions per minute, with the variable gear automatic in its action? This would certainly give ease in control, and it is improvements in this direction that will be urgently required when these handy cyclecars are used by owners knowing little or nothing of the mechanism. Drive by belt would give efficiency, and keep the machine lighter and cheaper to make.

Another departure from the normal—and perhaps the above arrangement of power would favour it—would be a system whereby the wheels are made to lean in to the curve when cornering, exactly on the principle of the cycle. Perhaps the bodywork might be included to some extent in this system, if it could be worked without complications. Proper banking

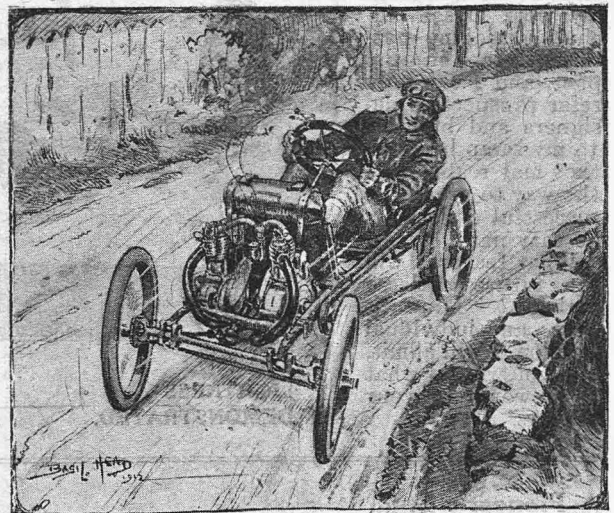
of the roads at corners gives the same effect as this, as far as strain on wheels and tyres is concerned, but we cannot look for such a condition of things for a long time to come.

R.W.R.

Proving Reliability.

By using the road instead of the railway for business purposes, I can get through twice as much work. A motorcar is too expensive; a motorcycle exposes one far too much to the elements and mud. A cyclecar just "fills the bill," being economical in upkeep, and, what is as important, it will fully protect one, and enable a commercial traveller to interview his customers in a presentable state.

There are only three cyclecars the manufacturers of which have had the courage to enter in all or most of the yearly reliability trials, viz., the A.-C., the Morgan and the G.W.K. For those who prefer four



Another suggestion by "R.W.R."—direct belt drive to each rear wheel from—

**MORE TO
THE POINT.**

wheels, it would be an interesting and instructive guide if the various manufacturers of other cyclecars of this type (and there appear to be very many) would publicly demonstrate their quality. I venture to suggest that until this takes place, intending purchasers, and especially the business man, will not look at the results of their time and labour. Some time must naturally elapse before the cyclecar has been developed to the extent to which the motorcar and motorcycle have been, so, in my humble opinion, it behoves manufacturers to prove early that their machines are thoroughly reliable and efficient, and, more important still, that they are built on sound lines. I hope to see cyclecars by the dozen included in the lists of competitors during the coming year.

ENTHUSIAST.

A47

A THORNY SUBJECT.

It came as a pleasant surprise when I first read about a journal being started solely for cyclecars, and I congratulate you on being the first to move in the matter.

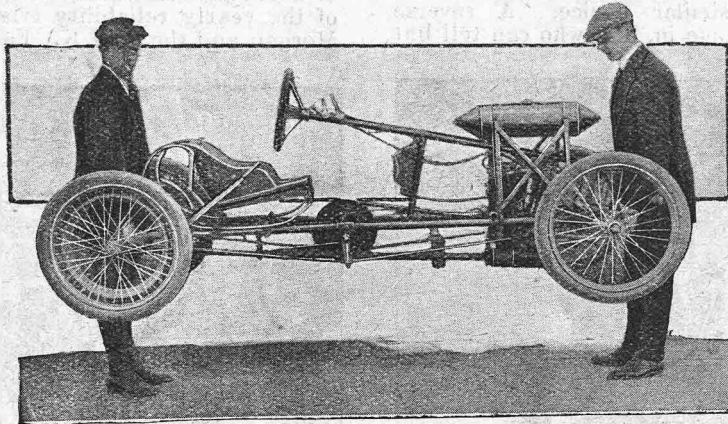
But there is a thorn in my side when I come to look through the various advertisements referring to so-called cyclecars. It seems to me that the prevailing practice of manufacturers who have anything fairly light to dispose of is to label it, in large letters, "cyclecar." Now this practice, either through ignorance or to draw the attention of prospective buyers, cannot be condemned too strongly, as the term "cyclecar," to my mind, denotes a vehicle built to carry one or two persons, and embodying the simplicity of a motorcycle with a motorcar's comfort. Now, I do not think that factors of glorified triecars and forecars can, by any stretch of imagination, label the same machines "cyclecars."

Further, how came the inventors of miniature motorcars lately illustrated in the motor Press to discern the likeness of a cyclecar in their production? I give it up. There must be something wrong somewhere. The question is, where? Is it in the R.A.C. definition of a cyclecar, or is it in the vendor's idea of what a cyclecar should resemble?

I suppose I may claim to have had a fair share of the ups and downs of cyclecar building, especially as I have done all my work myself, including making patterns, etc., in the past, and I can only refer prospective designers and builders to my scrap heap, so they may realize that the way to produce a successful cyclecar is no easy path.

What features will the future cyclecar embody? Mine is only an individual opinion. I will admit, but I offer it for what it is worth to your readers.

Lightness, Speed and Simplicity Combined.



**LIGHTNESS
DEMONSTRATED.**

**A simple 7 h.p. twin
single-seater, weighing 4 cwt.**

A Pioneer Designer Defines His Views of a Cyclecar.

Two-seater, side by side.

Engine, 8 h.p., twin, heavy flywheels, low compression, air-cooled.

Transmission, two chains to countershaft, giving high and low gear; operation of same being a matter of designer's taste.

Countershaft has differential mounted on same. 8 in. plain pulley mounted each end, thence by two 1 in. belts to back wheels.

Rack and pinion, steering 26 in. by 3½ in. to 3 in. car tyres.

Track, 4 ft.

Of course, designing cyclecars is like everything else, for what looks well to one person's eye does not to another's. There is plenty of room for dozens of designs of cyclecars, and no doubt out of all the experimenting we shall evolve something which is light, clean, simple and reliable, and lastly, after a fair return to the factors, cheap. But let us remember that nothing is cheap if it is nasty.

I think that the chief point to guard against is turning out four wheels and an egg box simply to catch the public whilst the fever is on. Makers of these machines will find that their customers will not return a second time, but perhaps they are not looking seriously into the future, only thinking of the present. I cannot say that I like wire steering or expanding pulleys, and with a wheel track anything over 3 ft., a differential is practically a necessity, because belts have a knack of slipping when not required, and, after all, what would be the extra cost of a differential compared with wear and tear of belts? No doubt standardizing of parts and a simple, cheap design is the solution, and I do not think it is far away.

H. E. DEW.

A Pioneer's Stud.

It is with great interest that I read of the production of a journal devoted to the cyclecar. My first motor was a 2½ h.p. Phoenix Trimco, 1903, fitted with a Minerva engine, 75 mm. by 75 mm., and surface carburetter. I fitted a two-speed gear in 1904. My next machine was a 3½ h.p. Phoenix Trimco, 1905, fitted with 82 mm. by 82 mm., Minerva chain drive and magneto. The next machine was a Phoenix Quadcar, in 1907. This I am now driving, and I am doubtful if any genuine cyclecar has been placed on the market to equal it until the last month or two. Wishing the new journal every success.

J. HART-SMITH.

No Rebate for the Motorcycle Licence.

Those motorcyclists who are contemplating disposing of their machines and purchasing cyclecars, for which they will have to pay a higher local taxation duty, will be interested to know that the £1 licences they hold are not likely to be accepted in part payment for the new licence.

The letter I enclose is in reply to an application I made to the authorities for some rebate, I being the holder of a £1 licence expiring on 31st December, but having disposed of my motorcycle in September, prior to purchasing a cyclecar in October. I think the phrase "reaping the benefit of the licence" is quaint, to say the least of it.

CHAS. S. LAKE.

Chalfont Common.

[The following is the letter referred to by Mr. Lake.]

"Dear Sir,—In reply to your letter of yesterday's date, I fear you are anticipating that you would get full allowance for the £1 licence paid in respect of your motorcycle, but this cannot be, as you have already been reaping the benefit of the licence for nine months. I have no power to accept a full-year licence in part payment of a part-year one, and your best course now will be to fill in the enclosed form and return it to me, together with remittance for the amount required, which will be half the amount shown upon the accompanying table. I shall then be able to issue you a part-year licence, and your motorcycle licence will remain unaffected to the date of its expiration.—Yours faithfully,

6th Nov., 1912.

"W. A. CHAPMAN."



Bewildered lorry driver, whose horse has a desire to balance on two legs, as a sporting monocarist takes a short cut to safety: "Elpus! What with motors and arioplanes and now a subterranean—'Ere 'old up, old girl!"

A Satisfactory Record with a Three-Wheeler.

I have found my Morgan a very great success, and although it is now nearing its second thousand miles, it has given me no trouble at all. So far, my tyres, which are about 3 in., have given me no cause for worry. I find that three wheels are perfectly satisfactory, and one would never think, when on the road, that one did not have four wheels under the car. I have been anxiously waiting for the first number of THE CYCLECAR, as I am sure it is bound to be a success, as cyclecaring has a fascination about it which cannot be kept down. Wishing your paper every success.

Salisbury.

RICHARD SPREAD.

Ladies and the Cyclecar.

I was very interested to hear about the new journal shortly to be published—THE CYCLECAR—and it should prove to be very popular with "us," as this form of motoring will be almost ideal for women. For one thing, a cyclecar will be less expensive than an ordinary car, while the garage space needed is small. In a cyclecar one can take a friend, and in this particular the cyclecar scores over the motorcycle. Of course, someone will remark, "What about a side-car?" True, but—there is always a but—how many ladies' motor-bicycles are strong enough or powerful enough to be thoroughly suitable for sidecar work? The question of appearance need no longer trouble us, for long boots, top-coats that used to suffer sadly from dust and mud, will be replaced by ordinary "car clothes," and we all know how nice they can be. Again, touring will be delightful, as luggage need not be limited to quite such an extent as when motoreycling. So far, I have only seen two ladies driving these smart little cyclecars. No doubt there will soon be very many of them.

MURIEL LORD.

Suggested Cyclecar Race.

I am interested in the suggestion that the Auto-Cycle Union should promote a cyclecar race in the Isle of Man during 1913. Apart from any discussion as to whether the Isle of Man authorities would permit of the additional inconvenience which would thus be imposed upon them, I really think this is rather an early stage to consider holding an event of this description. It is true that cyclecars are being developed very rapidly, and several machines have reached a high pitch of perfection, but it has to be a high pitch indeed to stand the strain of a T.T. and it would be a pity for the makers to bite off more than they could chew. A generally bad showing would probably shake the public's faith in this type of machine. Furthermore, this section of the industry is young, and the majority of its members are quite small men in the trade, to whom the necessary outlay on a T.T. race would probably spell ruin.

FRICION DISC.

Where the Cyclecar Scores.

I hold no brief for the railways, and agree that usually they come off best, but I think it only fair (and also to the interest of other cyclecar owners) to relate my personal experience. Recently I took delivery of a cyclecar consigned to me at Jarrow-on-Tyne from Selly Oak, Birmingham. To reach me the car had to pass through the hands of both the Midland and North-Eastern railway companies. It was consigned at railway company's risk (there is no damage, by the way), and the weight packed was 7 cwt. 10 lb. The rate charged is 66s. 8d. per ton, and the total charges I had to pay were £1 3s. 9d., including cartage both ends. I feel sure that cyclecar owners will be glad to know that there are at least two railway companies which believe in fair treatment.

CYCLECARIST.

Newcastle-on-Tyne.

TIME AND TROUBLE SAVED.

Wayside Adjustments
: : and Repairs. : :

Practical Hints from
: : Readers. : :

Starting Up.

LIKE most other things, there is a right and a wrong way of starting up the engine of a cyclecar. Moreover, with different types of engine, single-cylinders, two-cylinders, and four-cylinders, one must adopt different tactics. With the first, it is quite useless to attempt to "swing" the handle, a practice that is perfectly correct with a four-cylinder engine. With a single it is advisable slowly to work the engine round until one can feel that one is pulling up against compression, and as soon as the machine is nearly over compression to give the starting handle a sharp jerk *upwards* when the engine should start. Never, under any circumstances, attempt to start the engine by pushing the handle downwards, for should the machine backfire the kick of the handle would almost certainly dislocate the wrist, and might very probably break the arm. If a back-fire occurred when one was pulling the starting handle upwards, it would only jerk the handle from one's hand. On a four-cylinder, or V-type twin engine it is possible with a little experience to revolve the engine rapidly by means of the starting handle and to switch on when a fair number of revolutions have been obtained.

W.G.M.

Improvised Jacks.

FOR rapid tyre repair, a jack is a desirable accessory. The weight of most cyclecars is low, and consequently it is only necessary to set the jack at a height of an inch or two above the axle, place it in position, and push the machine back, as indicated in the accompanying illustration, until the wheel is lifted clear of the ground. The jack should be placed



How to remove the belt (from the rear pulley).

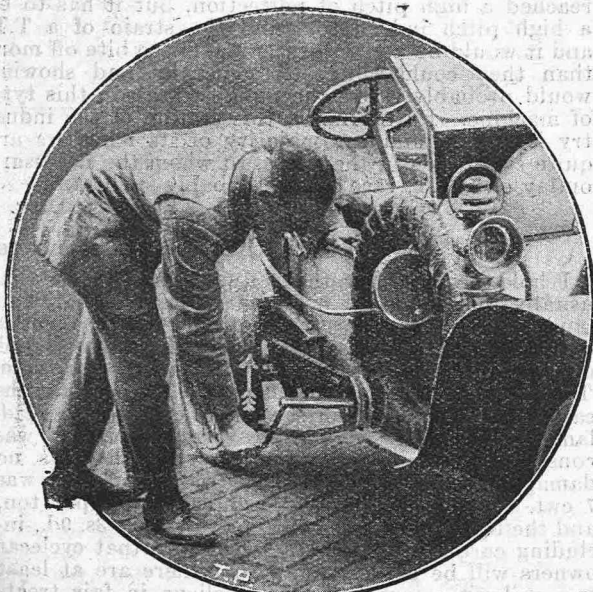
so that it will not slip as the axle is moved over it. A piece of hardwood, cut to the necessary size and shape will make an excellent substitute for the mechanical jack when used in the way described. Procure a suitable piece of ash, 2½ in. thick, cut in the shape of a triangle, with a base about 5 in. wide. The height should raise the wheel an inch or two above the ground, after allowing for a V-shaped slot to accommodate the axle.

P.B.

Removing a Belt.

THOSE unaccustomed to the handling of belt-driven machines may experience difficulty in removing belts. When the belts are used with variable pulleys and a hinged back axle, it is easy to remove them by opening out the countershaft pulleys to their fullest extremities and moving in the rear axle. The belt can then be unhooked or forced off the pulleys, as it will be hanging quite loose. If, however, the belt drive runs over solid pulleys the task is not quite so easy. First of all one must put the gear lever in the neutral, and then push the machine forward, at the same time pulling the belt sideways as it enters the countershaft pulley. It will be found that it will then mount the pulley side and eventually come clear of it. The belt can then be unhooked and removed entirely from the machine. To refit the belt quickly and easily, place it round the countershaft pulley, after having threaded it round the rear axle and joined up the ends by means of the belt fasteners, and then force half the belt into its place on the rear pulley. If the machine is then pushed backwards, the belt will find its way on to the rear drum.

G.W.



STARTING UP. Pull the handle in the direction indicated by the arrow in case of a back-fire.



JACKING UP. Simply push the cyclecar back and the wheel is lifted clear of the ground.

JACKING UP.