

Motor Cycling

Vol. 1, No. 2,
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& Motoring

THE CASE FOR STANDARDIZATION OF PARTS AND FITTINGS.

*Now is the opportunity for placing the Motor Cycle Industry upon a simple and uniform basis.
Later it may prove impossible.*

THE dream of the cyclist for a long time past has been to create some sort of standard for the various parts of his cycle; and good work is being done by the Cycle Engineers' Institute in endeavouring to bring somewhat into line the disparity that exists between the various bolts, nuts and their corresponding threads, and whilst the ultimate attainment of this ideal is still remote, it is to be desired that riders will peg away at the manufacturers of the component parts and get them to adopt some standard.

Here, at the commencement of comparatively a new industry, the chance is unique for accomplishing such a state of standardization amongst the various parts of the motor engine, its fittings and so forth. If a certain size of bolt is necessary for a particular part of the engine, and it is generally accepted by makers, then lay it down that in every engine this should be the size used; the number would guide the usefulness of its size. It would be better to err on the side of putting in too many bolts to withstand a strain than to put in too few.

Again, with such a fitting as

THE SPARKING PLUG.

We all know that this is a source so far of a good deal of trouble, and for the present it looks like continuing to be so. It will not be a difficult matter for all makers to tap the size of the hole for the plug of a standard diameter with a corresponding number of threads per inch, say, either of the gas thread standard of usual commercial pattern, or else to adopt the fine thread used by brass workers and known as the brass thread. Only let it be understood that this standard be worked to, and then we are sure of getting a plug that will be a fit without any fiddling required to be done, probably at a time when one can least afford to do so. The thickness of the metal where the sparking plug is inserted would likewise be a boon as well as a uniformity in making the length of the fitting the same by all makers. No harm can come to anyone who is willing to so conform to a standard. Look at kindred trades, such as the gas fittings. Here at once is a lesson where the sizes of burners have been regulated and adopted as uniform as to size and number of threads per inch, and although the fitting is done by means of a taper thread, one not to be

admired, still the principle of making a standard is the one to which attention is here drawn. Again, as to the various parts of the frame and its fittings, a very clear case in favour of standardization can be made out, and with a full knowledge possessed by the makers as to the requirements of the machine, for, as the reverse of a cycle, there is no need to study to that great extent that the machine shall be built to suit the rider, such parts as the pedals, chain, gear, sizes of axles, forks and crowns, steering tubes, etc., can all toe the line at a uniform size.

We know that it will be difficult to get the trade to agree to this state of things on account of the jealousy which naturally exists amongst them as to which machine is the best, but it would not hurt them in the least to

CATER FOR THE RIDER

for once, and give him a chance of being able to continue a journey from a place, supposing that in order to replace a broken part he is only able to get that of another maker. Each rider would swear by the maker of his own machine, because he had fallen into the line of uniformity, and instead of the trade being losers they would, in all likelihood, be gainers by the transaction. The question of the size of spanners is also one worthy of attention, and the adoption of ring spanners in the place of open-jawed ones would save many a barked finger and many a small swear.

It is to be hoped that these comments will be taken to heart by the trade, and at this, the early stage in the life of the motor cycle, some pretence shall be made to establish a standard in every part, and although there may be a good deal of rivalry amongst them as to which is the best engine, if they could be got to lay their case before, say the Cycle Engineers' Institute or some independent arbitrator, and agree to abide by the decision, we venture to think that one of the greatest improvements will be gained by the adoption of the standard in as many directions as possible, and that when the motor makers shall have led the way, there may be some chance for the cycle manufacturers to follow suit; and who amongst us would not hail such a decision with the utmost of delight?

SOME MOTOR CYCLE HISTORY, AND SOME PERSONAL EXPERIENCES: *Continued.*

By ANTHONY WESTLAKE.

THE Pennington bicycle appeared at the C.P. cycle show in 1898. This was a somewhat similar arrangement to the Wolfmuller, only

THE CYLINDERS WERE HORIZONTAL and reversed in their position, the heads pointing back and driving forward on to a pair of direct cranks. There were no ribs or other cooling device for these cylinders, which were fashioned from steel tube. Electrical ignition was fitted, but I never heard of this machine being at all practically ridden, it being one of those attempts to take an ordinary safety and gum an engine to it. However, it did have pedals, and was thus a true motor bicycle. At the same show I saw a small steam engine and boiler placed on a safety, the boiler in front of the handle-bar on a bracket, and a long stroke single cylinder driving directly on to pedal gear. It was

TOO SMALL TO BE PRACTICAL, although the intention was good. Major Holden's bicycle was also shown in an incomplete state on the Crypto stand at this same exhibition.

And now, I think, we may close the description of these incomplete evolutions of the past, and come to the era of the really practical development of the modern motor bicycle

In mentioning the advent of the practical motor bicycle in the foregoing, it is well to state that actually the two periods, as we may call them, overlap considerably. The early efforts were, almost without exception, aimed at direct driving with comparatively slow speed engines. This as a rule involves a heavier machine in proportion to power given off; in the development of steam engines exactly the same transition took place. For example, compare the dimensions of engine of a 30-knot Torpedo boat destroyer of 5,000 h.p. with 2,000 or 3,000 h.p. Atlantic liners of 40 years ago. It will be found that the latter weighed about 20 times as much as the former and occupied corresponding space—the difference laying in this: Forty years ago, men were content with engines running 30 to 60 revolutions per minute, and used 50 lbs. pressure; to-day 300 to 600 revolutions and 200 lbs. pressure are the rule. Although there are wide differences between steam and petrol engines, yet this rule to some degree holds good that the power of an engine to a large extent depends on the number of impulses given to a piston in a given time; thus in petrol engines, take a machine having 4 cylinders of 3-inch bore and stroke running at 500 revolutions per minute—it will give off approximately the same power as an engine having *one* cylinder of same dimensions running at 2,000 revolutions per minute; the number of impulses in both cases per minute are the same. Of course, the higher speed engine probably does not get the full charge of mixture each turn and has more resistance to the exhaust, and its power is correspondingly slightly less, but as it is, perhaps,

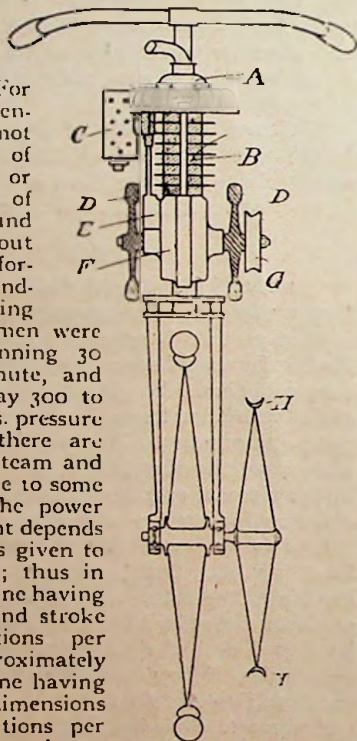


FIG. VII. THE WERNER, 1897.
A Inlet Valve. B Cylinder.
C Tube Ignition. DD Outside Fly Wheels. E Exhaust. F Crank Chamber G Engine Pulley. H Front Wheel Pulley.

about $\frac{1}{2}$ to $\frac{1}{3}$ the weight, its advantages to self propelled vehicles are at once obvious and its chances of going wrong are also diminished; also the internal friction of moving parts is less. These theories have been more than borne out in actual practice, for it was found that the high-speed engine was not only a better hill climber, but that its range of control was also far larger; there are practical reasons for that which we shall, perhaps, enter into at a later date. Daimler, curiously enough,

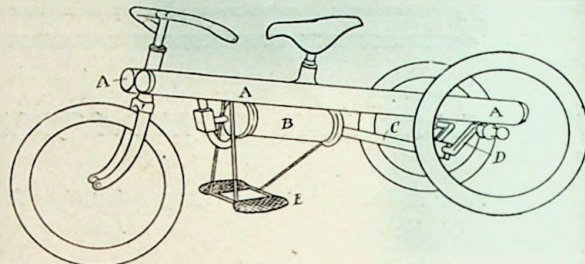


FIG. VIII. HIRAM MAXIM'S MOTOR CYCLE OF 1899
A Frame and Storage Tank Design. B Cylinder. C Connecting Rod. D Crank on Back Axle. E Footrests.

showed his grasp of the practical side of the question in 1885, for his bicycle engine was of the high-speed, geared down, type. As I have shown, up to 1898 men still tried to perfect direct driving, and indeed, in the Holden, it is continued to the present day. The latter is certainly a masterpiece of design for this type, and may prove very successful, but I fear its weight is much against it, together with one or two essential points which my experience has shown me a motor bicycle should have. The first practical motor bicycles were without doubt the inventions, one in Paris of Werner Freres, the other in Munich by Alexander Bluhm; both machines were produced almost at exactly the same date during 1897. I illustrate the first machine as made by Werners, which differed from the later type in having outside fly-wheels, and outside bearing for front wheel. The driving pulley also placed outside the forks, was really a hollow rim and small wheel,

BUILT ON A SORT OF SECONDARY HUB as a prolongation of the front wheel spindle. A reference to the drawing will make this clear. It was also fitted with tube and lamp ignition as were all the early De Dion machines.

The first Bluhm bicycle was a tandem (see drawing), and was remarkably effective, as it was a fair hill climber and attained a speed on the track of over 45 kilometres an hour (about 30 miles). It was chain driven, weighed about 150 lbs., and had a method of running the engine free, and curiously enough, in view of later developments, ignited its charge by means of an automatic catalyplatinum system, which was started by means of an electric current. Only the front rider had pedals, and these were mainly for starting the engine. The back passenger had foot rests only. The engine had a bore of 70 M.M. with a stroke of 70 M.M., and was geared to backwheel at 5 to 1. It was designed to run at a speed of 1,200 revolutions per minute. This engine drove a small sprocket wheel, geared to a larger one by a short chain; on the axle of large sprocket was a chain wheel which transmitted the drive to back wheel. This axle also carried the chain wheel (which was fitted with a direct clutch) by which the power for starting engine was conveyed from the front rider's pedals. A reference to the drawing should make this quite clear. This motor bicycle is still extant, and was running up to a short time ago, but I have not much news of it lately. It survived most of the early Werners and should be of great interest to latter day motor bicycle designers who, perhaps, fancy they have done something new in designing a machine chain

driven and started with overrunning clutches. The next machine which was designed by Bluhm has a great interest for me, as I have ridden it the greater part of the last three years, and is undoubtedly one of the oldest practical motor bicycles running, but a faulty casting (aluminium crank case) has developed defects which necessitate its retirement to some museum. This machine differs from the tandem in some important details. The engine (size, 65 M.M. bore, 70 M.M. stroke), instead of being connected by a chain to a large sprocket wheel, a toothed pinion took the place of the latter, and the engine axle had a small pinion in mesh with this, the axle in the large pinion was hollow and through it passed, running on ball bearings, the pedal axle; this, on the opposite side to pinion, had a sprocket wheel in connection by chain with back hub, and free wheel, the pedal axle could be connected or disconnected with the large pinion axle at will in order to start engine, or to pedal the machine as a simple bicycle.

The large toothed pinion had also a chain wheel on it driving a chain on the *other* side of back hub, also fitted with free wheel clutch, this latter was found absolutely necessary, to prevent chain breaking if engine back-fired. I show a diagram of engine and its arrangements; by-the-by, it is well to mention this machine had electric ignition, the contact breaker of which was fitted on large pinion axle. I have derived a great deal of pleasure from this machine and it was very reliable, as I had fitted it with a 2-gallon petrol tank and large lubricating oil reservoir, I could take fairly long journeys, my longest day's ride was 140 miles, starting 11 a.m. and finishing 7 in the evening, with two stops for personal refreshment. The machine could always average about

25 an hour over give and take roads, and owing to the pedalling gear being 84, I could assist the average of my mount up hill very materially and found it most exhilarating to do so. I never had an actual side-slip with this motor, but I came off once owing to trying to take a slippery corner at top speed. The whole concern simply slithered about 10 yards sideways and then lay down very suddenly indeed, so to speak. I rode home some 20 miles, later, which shows there wasn't much harm done. On another occasion I put on the first brake too suddenly on a very wet road, downhill; the front wheel simply locked, skidded, and once more "took the floor in style." Result: broken pedal and a lost temper. However the things and opinions I expressed to myself about myself on that occasion have so impressed me, that I have not repeated the performance since. I consider that both these falls really resulted from the weight of machine (some 140 lbs.), and the large diameter smooth tyres I used. I then fixed oat bands with most satisfactory results. It may be of general interest for motor cyclists to learn that Mons. Bluhm has lately designed a new type of machine, somewhat on the old lines but much simplified and lightened. This machine will be exhibited in the Automobile Club show at the Agricultural Hall in April—May. Although I have full particulars at hand, I am most unfortunately precluded from giving them as foreign patents are pending. The above machine was also made as a tricycle with no alteration to engine at all, simply a back bridge and balance gear in place of hub. I have ridden it a good deal in this form and it had some distinct advantages over the De Dion type. I may mention the chain drive as fitted was perfectly satisfactory, a $\frac{1}{4}$ inch racing chain lasted for two years, *i.e.* from 1898 to 1900, since that date two other chains have been used, and machine

is still as fit as new. The same sparking plug has been in use the whole time and is as efficient as ever. I am ready to satisfy anybody who may require further information on above points, but I think they nearly constitute a record.

And once more to retrace our steps a little. In the autumn of '98 I had a good deal of experience of the early "Werner." I was staying near Ostend at that time, and there is a lovely kind of Parade (commonly called "La Digue"), about 3 miles long, and after that continuing on a sort of brick footpath to Middlekerke, about 8 miles in all. It made a capital practice ground for my early experiments, in which I gained a lot of information about the effect of a strong sea breeze on tube and lamp ignition. The great advantage of this machine was that, when I was tired of playing at "motors" with it, I could take the belt off and it wasn't much worse than an ordinary bicycle. Under favourable conditions, one could get nearly 20 miles an hour out of it. The chief troubles were due to the carburetter, and the very exposed position of the ignition lamp. Regarded as the foundation of a large class or division of motor bicycle, it is full of interest, for the only difference between the frame and ordinary safety lay in the front forks, and I regard it as the first practical attempt to convert any usual form of bicycle into

a motor propelled machine; for there are, to my mind, three broad classes or divisions between modern motor bicycles, *i.e.* (1) Motors made or fitted to any ordinary pattern frame; (2) A frame built to take in an ordinary pattern motor as De Dion; (3) A machine in which both frame and motor are specially designed each to suit the other's essential requirements. The latter is undoubtedly what the 1902 pattern has come to, which shows that attempts to make a motor in order to convert any bicycle into a motor driven one are bound to be superseded by the more perfect

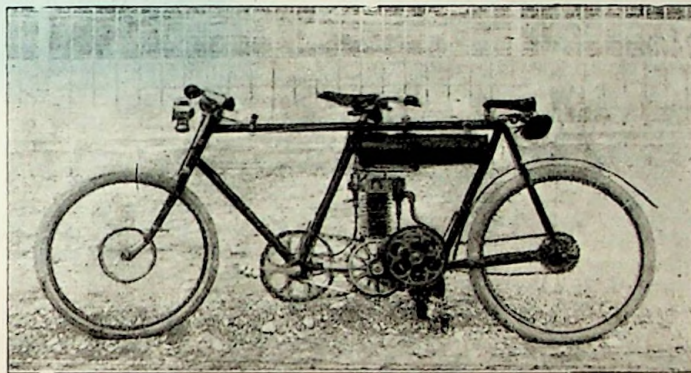


FIG. IX. THE BLUHM TANDEM, 1897.
(See previous page.)

combination designed for the altered conditions of traction which attain when a motor does the principal part of the propelling.

A machine belonging to the second category appeared in '99 known as the "Shaw," made by Shaw & Sons of Crawley. It had an ordinary $2\frac{1}{4}$ or $2\frac{3}{4}$ h.p. De Dion motor built in just behind the crank bracket; when it first appeared it had no pedals and was chain driven, absolutely rigidly, and was started by running the machine along till the engine chose to chip in. There was evidently a good deal in the machine that was commendable, as I have an acquaintance who has always sworn by it, and has ridden one consistently for some two years. The great drawback to the early type was undoubtedly the liability of the chain to break (which it used to do pretty often). This was, no doubt, occasioned by the back pinion being a fixed, instead of a free wheel, as in the "Bluhm;" but, of course, if Shaw had used a free wheel he would have had to arrange for some other method of starting the engine than the method named. But the difficulty has been apparently avoided by substituting a belt instead of a chain and attaching and pedalling gear on other side. The little experience I had of this machine showed it to be very fast and powerful "climber." Another machine belonging to type 2 will be shown at Fig. X. It was of French origin and I came across my first example of it at Easter '99, in the town of Ghent, Belgium: a $2\frac{1}{4}$ De Dion motor was placed transversely just in front of bottom bracket, which had no pedals but only rests for the feet. The engine shaft was continued by a long shaft having a universal joint at the engine end and a bevel gear at the back hub.

(To be continued)

THE IDEAL BICYCLE.

By G. P. MILLS.

The well-known veteran road-rider and record-breaker has interested himself in Motor Cycles for a long time past, and his views will be sure to command attention.

THAT motor bicycling has come to stay I think there is no doubt. The advantages of the motor bicycle over the motor tricycle are practically those of the ordinary bicycle over the ordinary tricycle. They are: single track, with the ability to pick one's path on bad roads, less vibration and ease of storage. Moreover, the motor bicycle is more efficient than the tricycle (an engine of a given power attaining more speed on the bicycle than on the tricycle). A motor bicycle, moreover, can be made more cheaply than a motor tricycle, a consideration which will appeal to many. The one disadvantage is side-slip. In this the tricycle undoubtedly scores, but this superiority of the tricycle is as apparent in the man-propelled type, yet few people prefer the three-wheeler to the two.

With regard to the matter of side-slip, I have found that, if a man drives *carefully*, in bad grease, he has little to fear, especially if he is careful not to check the engine by cutting off the spark, as the compression of the engine is a very powerful brake, and one knows that to apply any brake hard in grease is to court disaster. Personally, I find opening the valve lifter and braking by hand is the best way, if slowing in grease and when negotiating sharp corners. I have been out in some awful grease and have never fallen, although men on ordinary bicycles have come down when with me.

Motor bicycles have much improved lately, but the perfect motor bicycle has yet to be built and probably it is impossible at the present time to forecast what is wanted, for as we increase in knowledge, additions will be required to what we now think would be perfection. Again, that which would be perfection in one man's estimation might not suit another. However there are several points on which most motor bicyclists agree. Given petrol as the propelling agent and leaving the vexed question of the position of the motor alone for the time being, the following appears to me to be required—

A well-built motor of at least $1\frac{3}{4}$ h.p. with ample bearing surfaces so as to ensure long life.

A two-speed gear and a free engine, a result preferably obtained by a friction clutch, the high speed being the normal gear and the low speed bringing the gear into play for hill work.

A better means of power transmission. The belt at present used, although it has many advantages, will, I think, eventually give way to some form of chain drive, with either a spring pulley or a friction clutch. It is possible that the spring pulley which was a failure on a man-propelled vehicle, might be useful on a motor bicycle, as it would absorb the shocks as well. It is, however, open to criticism when the question of back firing crops up. The friction clutch on the other hand works both ways, and is in consequence probably more adapted for use with a chain. A valve lifter is undoubtedly far ahead of the old compression tap, and should be, I think, arranged to cut off the electric current in the way suggested by A. J. Wilson:

WHAT IS THE WAY?

It should, in my opinion, cut off the current before raising the valve, as it is sometimes very useful to use the compression of the engine in lieu of a brake.

With accumulator and coil, wiring should be as short as possible, but I think some form of magneto ignition will possibly

eventually oust the accumulator, chiefly owing to the re-charging question.

Spray carburetters appear to be favoured by several makers, though personally I lean towards a wick carburetter, having obtained most excellent results with this type in all sorts of weather. When arranged with an automatic feed from the petrol tank to keep the petrol at a certain level, this carburetter wants a lot of beating on a bicycle.

The tank should carry petrol for at least 150 miles and more if possible and

AUTOMATIC LUBRICATION IS WANTED.

All levers should be actuated from the handlebar and should be as few as possible, as nervous riders do not care to leave go one hand in an emergency, and dive for a tap on the top bar of the frame (a combination of switch valve lifter and brake might be made from one lever).

I fancy a back pedalling brake would be a good thing on a motor bicycle, as the feet are stationary a greater part of the time, and the application of the brake by the foot would leave the hands free for the manipulation of valve lifter, etc. Moreover, back pedalling brakes are very powerful, and power is required with such a heavy machine.

A two-speed hub is no doubt useful, as the low gear enables the rider to start his machine easily, and the high gear allows him to help the motor when running without having to pedal too fast. I consider, however, that both gears should have an automatic free wheel, as a fixed gear is unsuitable, and a mixed gear, that is one fixed and one free, decidedly dangerous. There should also be a big difference between the gears, say, 60 low and 90 high.

It is probable, however, that as we progress, the need for pedalling, except at starting, will be done away with. Having regard to the heavy dead weight carried by motor bicycles, a correctly triangulated frame is more suitable than the present style. There is, however, a difficulty in fitting tanks to this class of frame which at present militates against its use. This type of frame should, with an antivibratory front fork of good design, long wheel-base and a comfortable saddle, be a step in the right direction.

In conclusion, I would say, that those who take up motor cycling will find it, as I have done, a most fascinating pastime and one well worthy of attention.



VILLAGE CURIOSITY

NEWS.

In this column will be found every week the latest motor news from all quarters in concise form. The leading events will always be illustrated.

An instantaneous success!

No. 1 was completely sold out.

Our edition of 15,000 copies was totally inadequate to supply the demand.

The Ex-Empress Eugenie is one of the latest participants in the joys of motoring.

No less than 114 motors—cars and cycles—entered for the consumption competition, referred to in our last issue.

One of the earliest entrants for the events to be competed for during the Nice fortnight was Mr. Mark Mayhew.

The most interesting portion of the paragraph about the King's two new motor-cars is that they are to be built in Coventry.

We shall be pleased to hear from motor cyclists in the Midlands who would care to join a Midland section of the Motor Cycling Club.

The United States is strong in automobile clubs, having 36, followed by France with 27, Germany 15, England 10, Belgium 8, Italy 7.

The Crystal Palace was incomplete on the opening day, but on the other hand the majority of the stands was in full readiness for the visitors.

Another French consumption competition is on the carpet, to be competed for by the winners of each of the six classes in the event held on the 5th.

It is stated that a well-known oil refiner has discovered that it is possible to obtain from Caucasian naphtha petrol of a dynamic strength superior by ten per cent. to anything produced hitherto.

Apròpos of the recent fusion of the Automobile Club of France with the French Yacht Club, an ingenious member of the amalgamation suggests the Yachtomobile Club as an appropriate composite title for the new association.

More Royal patronage. The Dowager Queen of Italy has ordered a 12 h.p. car to be delivered with "the flowers that bloom in the spring." In the meantime she is making long excursions on her son's car.

Our readers who wish to hire motor bicycles may be glad to know that Werner, Minerva, Ormonde, and Mitchell motor bicycles may be hired for the day, week, or month from the Central Motor Co., 46a, Tottenham Street, Tottenham Court Road, W.

Italian Motor Bicycle Races.

Italian cyclists, like their English brethren, are moving in the matter of motor bicycle races. The Turin Cyclists' Club will hold a race for the single track machines at their opening meeting to be held during the first fortnight of March.

A Good Time of the Year.

There is no doubt but that the present time is a good one to hold a motor show from the buyers' point of view. For the manufacturers it may, even now, be a shade late, but perhaps there never will be found a time of the year which will suit all those who are engaged in the production of motors.

Gordon Bennett Cup.

The Sporting Committee of the Automobile Club de France met on Thursday afternoon, and have nominated MM. Fournier, Girardot, and Rene de Knyff to represent the tricolour. The substitutes are MM. Huillier, E. Giraud, and M. Farman, respectively. The event will be a match between England and France only this year.

The Sense of Proportion.

One of the most curious things that strike the visitor to the Palace Show is the way the huge glass building completely dwarfs the largest cars on view. Take, for instance, Edge's 50 h.p. Napier, which looks such a leviathan on the road; in the Palace it looks quite small though not exactly insignificant. Of course, the whole resolves itself around the sense of proportion.

Early Road Attempts.

Rigal, the "King of Motor Cyclists," as he is known on the other side of the channel, has had to abandon his attempt on the 100 kilometre road record, at present held by Beconnais in 1-18-54. He made a very satisfactory trial on Sunday, the 9th, the speed working out at 65 miles an hour. On the following day he started for the record attempt proper, but after going for less than three miles he was forced to abandon the trial owing to a severe snowstorm. He will try again very shortly, if M. Tampièr, the timekeeper, is available.

The Racing Cars at the Palace.

UNFORTUNATELY the Loan Collection of Racing Cars at the Crystal Palace did not materialise to the extent that had been hoped. A collection of interesting vehicles takes a lot of organising because so many promises are made unthinkingly and continual efforts require to be made in order to get them carried out. As a business man, S. F. Edge carried out his promise to the minute, and his 50 h.p. Napier car was attracting a deal of attention. This vehicle is the winner of the Tilburstow, Gaillon Hill and Automobile Clubs hill climbing competitions and has also done the following remarkable performances: 1 kilo in 32.25th secs., and 5 miles in 4 min. 44.35th secs. Charles Jarrott's 10 h.p. "Spider" which was second in the Tilburstow climb, is on view as well as his 8 h.p. racing tricycle which has accomplished 42 miles in the hour. Perhaps before the show closes other notable speed cars will be on view.

My latest invention: TABLOID GAS
Gentlemen, Buy a penny Obtainable
from every Chemist Ironmonger,
cycle agent or confectioner in
the United Kingdom. Insist
upon having no other
No Petrol; No Smell! No Mess!

Directions plainly printed on every packet.
Put a teacupful of water in
your carburettor and simply drop
in one of my Patent Tabloids which
required and cork up.
Instantly a volume of high
power gas is generated. Require
no further attention.

"TABLOID GAS."
Professor McPhoodle's Latest Notion.

The new Humber (chain driven) motor bicycle is reputed a flyer.

There are now five motor bicycles in New Zealand, and this type bids fair to become the most popular over there.

DON'T expect the same results from your engine as in summer. Everything is against the small engine in winter, from batteries downwards.

The Motor Cycling Club Races.

It has been decided to extend the time for necessary entries for the Motor Cycling Club races on Saturday next, till first post Friday morning. For entry forms apply to the assistant Hon. Secretary, G. E. Roberts, 29, Horsford Road, Brixton Hill.

In Cold Weather.

IN winter, when cold or damp is prevalent, as a rule better results are given by a surface carburetter, if one uses 660 petrol. Pratt's motorcar spirit can be obtained of this density on demand. It does not seem to give so powerful a mixture in summer, as it gives off apparently a thinner gas.

The Belgian Mails,

A COMPANY has been formed in Brussels with a capital of £12,000 to undertake the delivery by motorcars of postal matter at the chief offices in the City and the suburbs, at a cost not exceeding that of the present system of animal traction. A regular motor service between Brussels and Antwerp is being considered.

The Nice-Abazzia Race.

THE Automobile Club de Nice have been notified that the Italian authorities will allow the Nice to Abazzia race to take place over Italian territory. This is good news, for over three quarters of the course is Italian. France has refused to sanction the event, and it is doubtful whether Austria will permit it. However, if permission be not granted in these two countries, the contestants must "promenade" through quietly, and do the actual racing on Italian soil.

The Superfluous Horse.

What shall we do with our horses
 What shall we do with our steeds
 Now that modern mechanical forces
 Suffice for vehicular needs?
 They won't let them drag our busses
 From Hammersmith Broadway to Bow;
 Oh! what shall we do with our 'osses?
 We drivers would like to know.
 What shall we do with our horses?
 What shall we do with our cobs?
 Now that Sciences' ample resources
 Our backs have been relieved of their jobs.
 Oh! now that the cycle and motor
 Are ramping all over the show,
 Where would you have us to go ter?
 We riders would like to know.
 Listen, ye riders and drivers
 Of an animal much out of date!
 List to the guess which I give as
 Your *protegr's* ultimate fate.
 One in the British Museum
 Carefully stuffed you will find;
 Thousands will flock there to see 'im,
 Specimen he of his kind.
 'Tothers, whose tipeness has rotted
 Slowly in growler or tram,
 Will when they perish be potted
 Under the pseudonym "Ham."

— SAXON BROWN.

The C.T.C. Gathering A Motor Section Formed. Motors Discussed.

AN interesting meeting convened by Mr. Rees Jeffreys, the chairman of the Metropolitan District Association C.T.C., was held in the Society of Arts Lecture Hall, last Tuesday. The object was to form a motor cycle section in connection with this body, and to exchange experiences generally upon the subject.

About sixteen of the most popular makes of motor bicycles had been lent by the various makers, this lending an additional interest to the proceedings.

The machines we noted were: The Singer, Excelsior, Chappelle, Ivel, Humber, Enfield, Bradbury, Bowden, Derby, Trent, Martini, Holden, Phoenix and Shaw.

Mr. Rees Jeffreys took the chair at a good gathering of enthusiasts, supported by Mr. A. Moresby White, the secretary. The proceedings were opened by Mr. Joseph Pennell, who, in a racy speech, plunged in *medias res*, touching on one thing and the other, but always enthusi-

in evidence, and Dan Albone instanced the danger of fitting motors to ordinary machines of inferior make. The point as to the advisability of adopting 26 inch wheels in place of 28 inch was also touched upon. What we should like to have heard, and so would many others in the room, would have been experiences as to up-keep, and actual experiences of the several machines now on the market. Probably, except for the older ones mentioned by one or two speakers, riders have not so far given a good test to several makes, which appear theoretically excellent. Mr. Rees Jeffreys then intimated that a motor cycle section had been formed, and paid a graceful compliment to the bantling, "MOTOR CYCLING."

It is stated that the only steam car allowed to traverse the streets of St. Petersburg is that made by the well-known Gardner-Serpollet firm.

ONE of the first things to get after purchasing the motor bicycle is a stand that can be used to try the motor before going out for a run. A correspondent writes to say that he can recommend a stand at 3s. 6d. made by the Devonshire Cycle Co., Brookhill, Sheffield.

A Seasonable Hint.

USERS of spray carburetters should see that their induction tubes have some efficient means of artificial warmth, a bit of flannel or a tin shield protecting same from "winter's blast" are better than nothing.

A Special Machine.

Jarrett's new speed motor bicycle is now being made by Werner Freres. We believe the dimensions of the engine are the largest that can possibly be fitted into a bicycle. When the "speed beast" comes home, we reckon that the big car times will be closely approached.

The Paris to Vienna Race.

THE Automobile Club de France has been officially advised that the Austrian Government has decided to grant the necessary permit for the Paris to Vienna race. This, of course only applies to the portion of road traversed in Austria, and it is yet undecided and very doubtful whether the race will be allowed in France.

Fournier in America.

THE German Steamer *Kaiser Wilhelm* arrived in New York on Wednesday last had on board Henry Fournier, back from Paris and ready to start business with his newly formed American Company.

With Fournier, went also Alex. Verleyen, once a well-known German cyclist, who is to help him in his new venture.

Motor Car v. Train.

AN accident recalling Fournier's famous collision with an engine last year in America happened last Wednesday near Nice.

A motorcar steered by a young lady belonging to the American colony, Miss Schiff, was nearly smashed by a goods train while going over a railway crossing, the gates of which had been left open by mistake. Luckily the lady was able to stop the car just in time, and although the front part was smashed, she, as well as the three people who accompanied her escaped unhurt.

Proceedings are being brought against the faulty gate-keeper



MR. W. REES JEFFREYS.

The Chairman of the Metropolitan District Association, who organised the exhibition of motor bicycles at the Society of Arts and took the Chair at the meeting of the Motor Cycle Section, is perhaps better known as the Honorary Secretary of the Roads Improvement Association.

astic over his subject. General discussion was then invited, suggested points being the frame of bicycle and power of the engine. Some speeches called out for a higher-powered engine, but the general opinion was that 1½ h.p. was quite high enough, and J. van Hooydonk pointed out that the chief feature of the motor-bicycle was the light engine and comparative light weight of machine. High power engines, as he had discovered, shook the machine too much, causing lamps to break up and cyclometers to fly up to the trees; his solution was a two-speed gear for the engine to help up hills.

On the question of side slip, there was much difference of opinion, although we fancy the balance was slightly in favour of fixing the engine between the two wheels. Advocates of the belt and the chain were

IN TRANSIT.

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

How the Engine Works.

THE Editor has handed the following letter to me with the request that I should deal with it suitably and, on perusing it, I am struck with the fact that we fell into the usual experts' error of taking for granted that our readers are, one and all, conversant with the elements of the subject with which we were dealing. A. J. M., of Honiton, says, *inter alia*, "You deal thoroughly enough in your first issue with some of the technical matters pertaining to the motor bicycle, but I was disappointed at the absence of the piece of information of which I am in need, namely, the principles upon which the engine works. With an explanation of these before me, I should be better able to follow your treatises upon the various parts of the motor and shall all the sooner make my investment in a motor cycle." I hasten, therefore, to atone for the omission and if I keep the explanation short and to the point, it will be because it can only be of use to a small proportion of our readers. The others not only know what the parts of the motor are intended to do, but they know a lot of the things they won't do.

I suppose that the propelling mechanism of the motor bicycle may be divided into three parts. The first is the petrol tank and carburetter, the former where the petrol is stored and the latter where it is vaporised. In the second division is the engine which is designed to be driven by the explosion of a charge of gas and air in the combustion chamber above the piston. The third item is the electrical apparatus for producing a spark in the combustion chamber for the purpose of exploding the charge. There are various methods of producing the gas, but the most convenient method is to carry liquid petrol which is a highly volatile spirit distilled from petroleum. Petrol vaporises rapidly under atmospheric pressure and it is always carried in a tank as nearly air-tight as possible. Petrol vapour, whilst being volatile, is not explosive, unless it be mixed with a certain proportion of air. To assist vaporisation, petrol is allowed to flow into a compartment of the tank, known as the carburetter, having an outlet in a pipe communicating with the combustion chamber of the engine through a valve which opens towards the latter. Air passing over the surface of the petrol picks up a quantity of the vapour and then passes to a mixing chamber, the motive force being the suction of the motor. This mixing chamber has an opening to the outer air which is capable of being adjusted as to size. On the suction stroke of the engine, it sucks in a mixture composed of the vapour-laden air from the carburetter and of as much additional air as the driver allows to pass through the air inlet of the mixing chamber.

The piston of the engine has a cycle of four movements. At the first downward stroke it sucks in a charge of "mixture"; at the next upward stroke this charge is compressed into about a third of the space it first occupied. When fully compressed, an electrical circuit is completed and rapidly broken by mechanically timed motions and a spark is caused to jump across the gap between the two points of a plug inside the combustion chamber; the spark explodes the charge of compressed gas, which then expands to a large volume, driving the piston down, so giving forth driving power. On the return stroke an exhaust valve automatically opens and the exhausted gases are expelled into a silencer where they get broken up and dispersed with a considerable reduction of noise. The piston then recommences the cycle of movements which is repeated at a very rapid rate ranging from 600 to 1,500 revolutions of the crank per minute. From ten to twenty-five revolutions per second sounds enormously rapid, but a large number of minute explosions means the production of a substantial volume of power. The electrical spark is obtained from a battery or an accumulator charged to four and a half volts. The current from either of these is a low-tension current and is automatically made and broken by the movements of the engine: The primary current passes through a coil, "in-

ducing" a high tension current to pass over a secondary circuit to the sparking plug where it is forced to jump the gap, thus giving forth the requisite spark. The internal combustion engine at a low weight for so high an efficiency is a monument to the skill of modern engineers.

How to set about Motoring.

In most walks of life, making a start is always a difficult matter, but it is not so difficult to start managing a motor cycle as one might at first imagine. As a matter of fact, it is more difficult for a cyclist to choose a motor bicycle than it is for him to manage one. The man who is about to become a motor cyclist will naturally ask how he is to set about it. The first thing to do after selecting the machine, but before ordering it, is to deliberate upon the place in which to keep it. It must not be forgotten that a machine weighing approximately three-quarters of a hundredweight is not to be handled as easily as one is wont to handle an ordinary cycle. To carry a motor cycle up and down a flight of steps or stairs means a two-handed job, whilst the vehicle is not to be easily conjured round awkward corners. In the event of the accommodation at home being unsuitable it can usually be obtained at an adjacent livery stable at about a shilling a week.

An important matter is a stand upon which to rest the rear portion of the machine, and this stand should be sufficiently substantial to permit the rider to sit on the machine and run the engine. Such a stand is to be obtained at any dealers or it can readily be made by anyone fond of carpentering. Then an order should be given for a two-gallon can of petrol; the price for this is from 1s. to 1s. 6d. a gallon with a deposit of 2s. 8d. on the can. The can is usually closed with a round brass screw cap with a square keyhole in the centre. This can be unscrewed by inserting one jaw of a screw spanner into the key way and tightening up the spanner so that it grips the edge of the cap; the cap is then readily loosened. It must not be forgotten that petrol, being highly volatile, is very inflammable and should therefore be kept away from all lights. Another purchase will be a quart tin of engine oil—either Price's Motorine, Wells-Lucas' "Superb" Motor Oil, or United Motor Industries' D. Oil.

WHEN the machine is received, a most interesting time is opened up for the man who has a love for mechanics. We-days, that to a cyclist would mean cycling inaction and there fore a great waste of time, can be devoted by the motor cyclist to familiarising himself with the working details of his machine. As we must all learn to walk before we can run, the cautious man will take the course in easy stages. One day he will carefully inspect and study the inlet and exhaust valves; at another time, the contact breaker. The system of lubrication, the electrical details and in fact every minor part of the machine, afford educational opportunities that are not to be despised. And the value of the knowledge will only be appreciated to the full when trouble comes upon one on the road. To be able to trace a defect in a few minutes, instead of perhaps spending an anxious hour in the search, and at the same time to avoid meddling with and possibly messing up other parts of the machine is the sort of thing that makes a pleasure of what otherwise would be a disagreeable task.

THE question of clothing suitable for wear when riding a motor bicycle is rather too important a subject to be dealt with in the small space at my disposal. Moreover, our tailors and outfitters have, so far, given little or no thought to this matter, preferring, may be, to wait until we ourselves know more exactly what our requirements are. The main difficulty, especially during the present kind of weather, is to keep warm, and I must confess that so far I have not succeeded in hitting upon the right thing, though one's cycling experience helps one to attain that end more easily than one otherwise would.

CYCLONOT.



Conducted by
EDMUND DANGERFIELD
and WALTER GROVES.

Manager:
ERNEST PERMAN.

Proprietors:
TEMPLE PRESS, LIMITED,
7, 9, 11, 13, 15, ROSEBERY AVENUE, LONDON, E.C.

OPINION.

Our Reception.

FIFTEEN thousand copies of "No. 1" were printed and the whole issue completely sold out within twenty-four hours. Had a further ten thousand been added to the printing order, it would have been none too many, but a reprint was impossible. Whilst in this direction our most sanguine expectations have been exceeded, our reception by the world at large is all that we could wish for, as is testified upon another page where a large number of quotations appear. In view of the interest taken being so great, there can surely be no further question as to the future of the motor bicycle. Those who up to now have been hesitating on the brink, should decide to take the plunge and follow both trade and pastime from its infancy. We have shown our confidence in the future in substantial form, and if the inception of this journal is to prove the signal for a general advance in a great movement, a movement with unlimited possibilities, our mission will have been more than fulfilled. Since penning the foregoing we learn that orders for No. 2 show large increases.

Demand Exceeds Supply.

IN the few weeks which have elapsed since the autumn cycle shows, there has undeniably been a tremendous jump in all directions where motor cycles are concerned. In early November a very large proportion of manufacturers viewed the new machine with considerable doubt, and not without reason. Generally speaking, very little was known of it. The shows, however, brought suddenly to the front a demand which was entirely unexpected, with the result that since that date the trade has hurried matters forward to such an extent that a large number of striking improvements in detail have already been made, and also a by no means inconsiderable quantity of entirely new designs embodying bold departures from precedents.

It is too early yet to speak of the success or otherwise of the Palace Show, from a business point of view, but there is ample evidence that public interest has been seriously aroused and in view of the unprepared condition of the trade as a whole to meet any large demand, the situation is one which requires the closest attention. For weeks past the manufacturers or vendors of the best known brands of either complete machines or only parts, have reported to us that they cannot get supplies fast enough, and in a large number of instances we have been afforded ample proof of the statement.

Never in our experience have we found the cycle trade so unanimous as to the favourable chances of an innovation as it is upon the present time. When a year or so ago "CYCLING" prophesied the coming of the free-wheel, a very large proportion of leading manufacturers expressed a decidedly opposite opinion. Upon the present occasion there is a sweeping majority who declare themselves in favour of the motor cycle, imperfect as it is. The few who condemn the power-propelled machine seem for the most part to assume that it is incapable of improvement. "Who is going to be bothered with such a thing?" is the way they put it. By this time next year we venture the opinion that British talent and attention will have enormously advanced improvement in construction, detail, and all else, and those are now busy upon the matter will in most cases have the enormous advantage of a long start and good reputations. As is always inevitable, there will be those who will set to work in the wrong way, possibly to meet disaster, but to get on in business now-a-days one must venture and at the same time be cautious. In handling a machine where so much scope exists for rapid improvement, it would be unwise on the part of anyone to sink a fortune for the purpose of securing an enormous output. We think that for a long time to come the manufacture of the motor bicycle will be in the hands of the many, in fact, as we stated in our last, it is the small man's opportunity, but it by no means follows that the big makers will fail to give it attention and a lot of it; they are doing so in all directions. We think it will now be generally conceded that the motor cycle is destined to be either an utter and entire failure or a huge success. The few who up to quite recently have held the former opinion must surely be doubting their judgment.

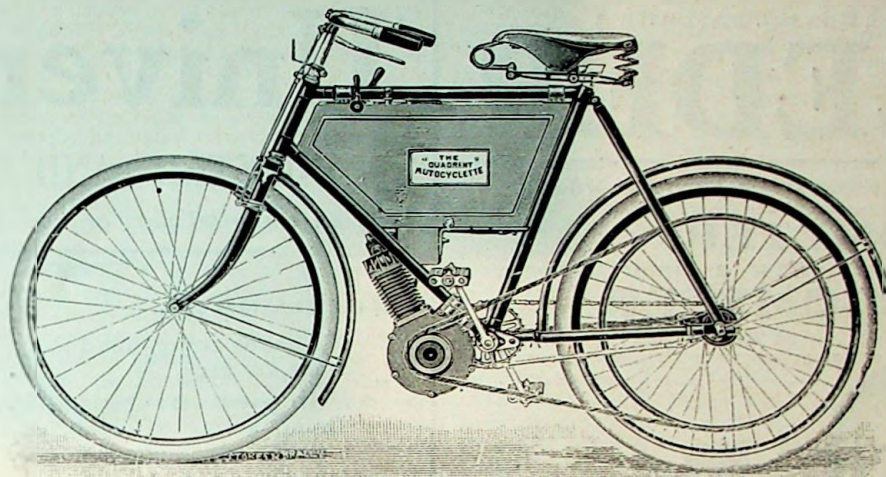
A New Association Wanted.

FEELING somewhat uncertain as to the attitude which the Automobile Club would take up towards motor cyclists, we, some days ago, journeyed down to Whitehall, and discussed the matter with Secretary Claud Johnson, who agreed with us that it would be a pity for an entirely separate association to be formed if some co-operative scheme could be devised. Motor cyclists will not require palatial club premises and consequent heavy calls upon the purse; at the same time they will be very numerous and sufficiently so to require special attention to their particular requirements. They will want quarters sufficiently convenient for the purpose of arranging events of a multifarious nature, the periodical reading of papers scientific and entertaining. They will endeavour to enjoy to the fullest extent the fascinations of their pastime, and they will *not* want to be mere hangers-on to any club or association which might regard them askance. Our idea is that a strong man should be sought for who shall be ready and willing to handle an entirely new association to be formed for the purposes described, and generally to push the pastime forward with vigour and enthusiasm. Mr. Johnson approved our suggestion of a new association, and added that he would propose to his committee that any such body should be affiliated to the Automobile Club, presumably in consideration of certain specified advantages. He has since written us that his committee regards such a scheme as being possible, and it now rests with motor cyclists themselves to give expression to their ideas. A feeble, half-hearted affair will be worse than useless; it is necessary that the thing be done properly or not at all.

IN NEXT WEEK'S ISSUE.

We shall give the final instalment of *Motor Bicycle History*, several interesting articles, illustrations of novelties at the Show, and all the news of the Motor Cycle world.

RIGHT AHEAD !!!



MOTOR CYCLISTS

will be glad to learn that we have so simplified the working of our Motor Bicycle that

ONE LEVER DOES

ALL THE WORK

usually done by four, namely, switches on electricity, opens and closes exhaust valve, regulates supply of gas, and graduates the sparking.

What we get by it. (1)—*A sweeping away of three-fourths of the gear.* (2)—*Extreme simplicity of working; any cyclist can ride it straight off.* (3)—*No confusion in City traffic: one pull of the lever in the fraction of a second converts the motor into ordinary bicycle action.* (4)—*Restive horses can be passed in absolute silence.* (5)—*As the conversion is instantaneous, advantage can be taken of the shortest lengths of road suitable for free-wheeling, the engine being cooled at same time and large economy effected in gas and electricity.* (6)—*The harmony in the time of sparking in proportion to supply of gas gives the very highest results at all speeds.* (7)—*Back-firing and all such wasteful and destructive irregularities quite avoidable.* (8)—*Speed is controlled as simply as water from a tap.* (9)—*When exhaust valve is opened it remains open at the pleasure of rider. It requires no holding.* (10)—*The handlebar is free of all encumbrances.* (11)—*The current from switch to sparking plug is short, direct and more efficient.* (12)—*Compression tap is abolished and no special valve-lifter required.*

Makers: **THE QUADRANT CYCLE Co., Ltd.,**
Sheepcote Street, BIRMINGHAM.

Branches: (Wholesale and Retail). London—110, Newgate Street. Leeds—8, New Station Street. Manchester—13, Victoria Street.
Cardiff—35, Castle Street. Bristol—45, Park Street. Agencies everywhere.

When Buying . . .

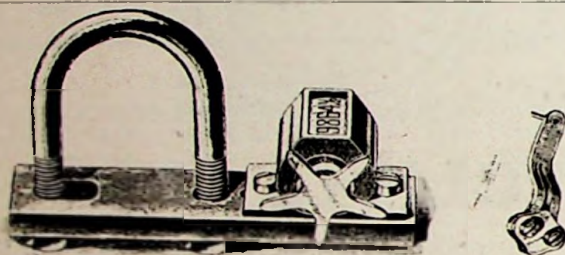
**A Motor Bicycle
Motor Tricycle,
or Motor Car,**

See that it is equipped with a

VEEDER

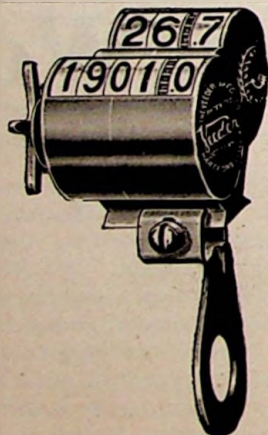
(It is the World's Distance Recorder).

An **ODOMETER**
for a Motor Car.
or a **CYCLOMETER**
for a Motor Bicycle.



THE ODOMETER WITH HOOK ATTACHMENTS.

Different styles of attachments can be supplied to suit different types of cars for any size wheels 24" to 50".



Can be fitted to any Motor Bicycle or Tricycle.

Supplied for 24", 26", 28" or 30" Wheels.

THE TRIP CYCLOMETER.

Fully Guaranteed. Write for Booklets.

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MARKT & CO., 20, Chapel St., Milton St., LONDON.

KINDLY MENTION "MOTOR CYCLING" WHEN CORRESPONDING WITH ADVERTISERS.

SOME REASONS WHY

. . . The . . .

'Universal'

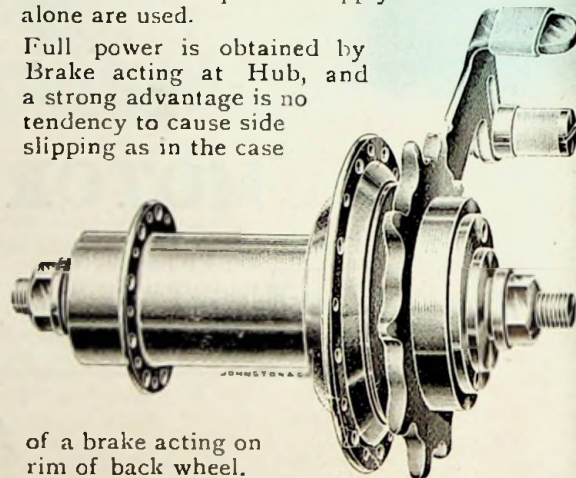
COASTER AND BRAKE

is an essential part of any Motor Bicycle.

Because:—

No hands are required to apply brake—the feet alone are used.

Full power is obtained by Brake acting at Hub, and a strong advantage is no tendency to cause side slipping as in the case



of a brake acting on rim of back wheel.

The forward drive and release are instantaneous.

And because:—

It is a combined Hub, Free Wheel, and Back-Pedalling Brake in one.

Supplied in all Chain Lines.

AWARDED MEDAL, & HIGHEST HONOURS AT BUFFALO EXHIBITION.

THE CRYSTAL PALACE SHOW.

*Small, but motor bicycles very representative of the industry.
Exhibits very backward on the opening day.*

THE motor car and motor cycle show organised by Mr. F. W. Baily and his confreres opened on Friday last. It was however, far from complete, some of the stands remaining empty until the next day, whilst some of the exhibits were not placed on view until Monday. This was unfortunate from our own point of view, but it is a state of things to which one gets case-hardened in time.

The show is small. One could walk the whole length of the gangways in a quarter of an hour, but the motor cyclist could profitably and interestingly spend two or three hours there, and if a study of the cars were to be added, there would be a lengthy day's work before the spectator. But, though small, in point of number of exhibits, the show is not unrepresentative, and there is this advantage derived from the smallness of entry—ample space is given to each vehicle, permitting the prospective buyer to get "all over it," as the saying goes. If the show offers a capital opportunity for a ready survey of the market in cars and voitures, it is at once strong and attractive in the motor cycle section. The only machines which are in any way notable, or which have any vogue, that were absent were the Simms, the Hewetson and the Singer.

The tendency in motor cycles seems to be undoubtedly towards the vertical engine. Efficient lubrication, capable of being effected from the saddle, is being generally provided for, whilst many attempts to replace the surface carburetter with some form of pulveriser are evident. Whether an efficient

and reliable spray or float feed carburetter, suitable to the conditions obtaining on the cycle, will be produced, remains yet to be proved. Outside flywheels appear in a few instances, but the first thought is that there is distinct loss of compactness, whilst the need is created for a guarding of the rider's clothes from contact with the rapidly revolving wheel. Efforts are being made to master chain driving; whether we shall be more successful in this matter than our neighbours on the Continent have been is a question, but if success be not ultimately obtained it will at least not be for want of striving. But whether the chain takes first place or not as a means of transmission, some improvement is necessary to overcome slipping of the belt on the engine pulley. We observed that the public are becoming much better informed upon motor matters. There was an absence of the silly question such as "What is that thing for?" Interrogations rather took the form of "Have you an exhaust valve lifter?" and "Do you not think that the spray carburetter is more liable to weather changes than the surface kind?" A considerable amount of ingenuity is displayed by the more advanced manufacturers of the cycles.

In the detailed report which follows, we have purposely avoided going over the ground which has already been covered, especially in view of the fact that we have in our mind a series of articles which shall deal thoroughly and exhaustively with each type of motor bicycle.

The *Ariel Co., Ltd.* Made on exactly the same lines as the well known Ariel quad, it nevertheless displays many important points, not so much in the engine as in several important items. The back driver is not attached to the spokes of the wheel, but is slung from the rim, so that it can be sure of being absolutely true, an advantage which one will speedily recognise when the wheel which is attached to the spokes so speedily gets out of truth and loss of power ensues. A very novel and simple combined oil tank and pump is attached to the frame. The action of pulling up the spindle is to draw in a charge of oil whilst the downward pressure forces it into the crank case. The general finish is the Ariel's own, and nothing is wanting to render the design more attractive than to say it is an Ariel. The price is £45. An Ariel quad is also exhibited, price £150.



THE ARIEL
SIGHT FEED
LUBRICATOR.

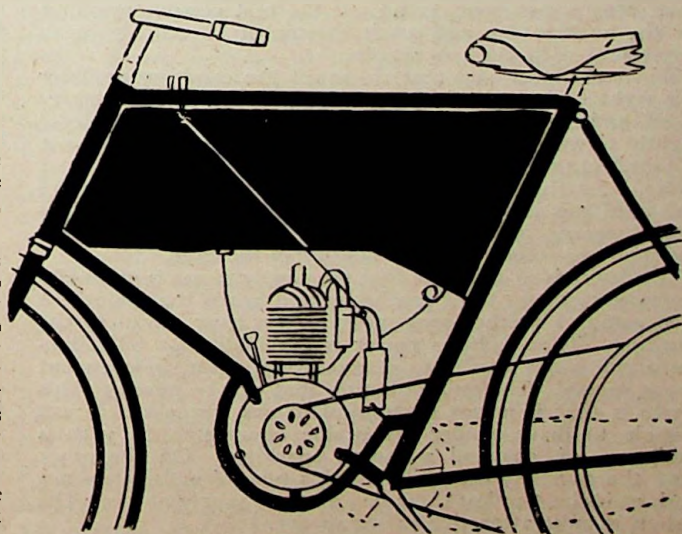
Dan Albone is showing a new type of machine suitable for ladies and elderly gentlemen, strong and of the usual good finish, fitted with $1\frac{1}{2}$ h.p. Minerva engine, driving by hide rope well protected to prevent catching the skirts. All levers are well placed and the whole is under thorough control; two brakes are fitted back and front, both on the rims, and Brookes' saddle with back support. A well-designed and thought-out machine, and priced at £47.

Farman Automobile Agency.—In this cycle the engine is fitted nearly at the top of the bottom diagonal and rather to the offside, with the fly-wheel counterbalancing it on the near side. The engine is $1\frac{1}{2}$ h.p. and has been made so as to fit into any good roadster machine. The drive is by a hide rope over a jockey pulley which can be adjusted if necessary, spray carburetter, and a waterproof induction coil so preventing the likelihood of trouble from rain. The lubrication is automatic and the complete machines is listed at £45. They also show a fine assortment of lamps and motor accessories.

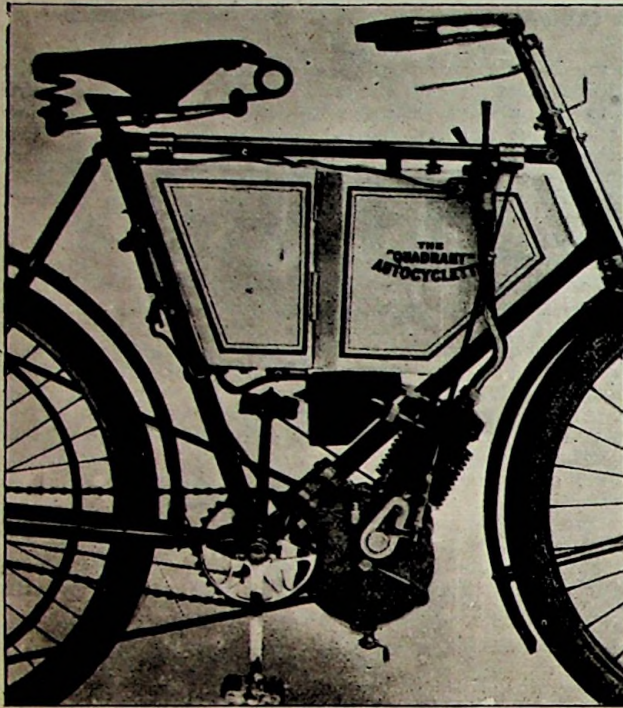
Haycraft & Sons Ltd.—Although not makers they show the latest form of steam car, with air-cooled condenser or the exhaust steam and with pump to return the water to the boiler, thus very much increasing the length of run without having

to stop for water. They are also showing a Triumph bicycle fitted with a Minerva motor, and a good assortment of motor accessories.

The *East Riding Cycle and Motor Co.* show a novel departure in fitting the engine inside a loop formed in the bottom diagonal, the engine being vertically placed. The drive is by belting. Spray carburetter. Tanks for storage of petrol equal to 130-140 miles, together with two accumulators, induction coil, and lubricating oil being contained in one case. A sight feed lubricator is fitted for the case and an extra supply to the bearings. The silencer is of the triple type, so that little noise can be heard from the exhaust. Two levers perform the whole of the movements for regulation of speed; that on the right is the advance sparking and exhaust lifter, whilst that on the left is the mixer. Two brakes are fitted.



THE "VIPER" MOTOR BICYCLE.



THE QUADRANT—CONTROLLED BY A SINGLE LEVER.

WE illustrate the latest development in connection with the Quadrant motor bicycle, and judging by the interest that has been taken in the innovation, the firm is likely to receive a great amount of publicity and most probably increased trade in consequence.

The reader at a glance will see that abolishing the compression tap and advance spark lever, together with the objectionable and unsightly wiring, has done much to improve the appearance of the bicycle. Briefly, the entire manipulation of the engine is done by one lever. The air lever, when once set, is seldom interfered with for hours, and even in this connection, the management of the Quadrant Company have, after experiment, found out the best possible mixtures for the average day and mark the top of the air lever to correspond with the gas supply.

When the lever—by that we mean the combination lever—is right back, everything, gas, compression and electricity is off, and the exhaust valve is open. On pushing the lever slightly forward the current is switched on by the entrance of a small tang on the lower side of the lever between two copper plates. As the lever is advanced the exhaust valve closes and until this is done no gas is supplied to the engine. As soon, however, as the valve closes the supply of gas begins and increases according to the position of the lever.

The device is so arranged that the supply of gas is gradually increased right up to its maximum and, when that point has been attained, further movement of the lever advances the sparking. Thus full gas power is obtainable for hill-climbing, and it is not possible to advance the sparking independent of gas supply. The only objection that can be raised to this device is that it is not economical in gas, because it is not possible to drive, under favourable circumstances, with a minimum of gas and advanced sparking. On the other hand the company contend that this type of motor does not work at its best unless there be an ample supply of gas. The system is most attractive to the novice.

A cyclist who is compelled to ride in the traffic of our leading towns will appreciate another important fact in connection

with the Quadrant machine. That is that immediately the lever is pulled right back the machine is simply an ordinary free-wheel bicycle and can be ridden amongst restive horses without creating the least noise. We are inclined to think that the Sheepcote Street Company have secured a very valuable improvement for their customers. Machines fitted with this arrangement attract a lot of attention at the Crystal Palace Show.

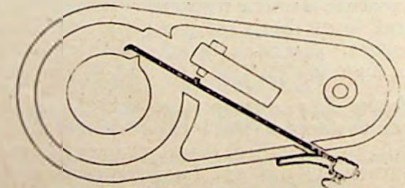
The Wellington sparking plug is a specimen of what can be devised by careful thought and complete knowledge of the requirements. It sells at 4s. 6d., but its efficiency renders it well worth the price asked.

Steiner & Co., of 142, Houndsditch, make an attractive exhibit of cycle and motor horns in a multitudinous variety of patterns. The quality of these goods, as well as of the pumps, lamps, and other motor sundries is unsurpassed, whilst all tastes and pockets are being catered for.

New Hudson.—Harry Jones, 148, Gray's Inn Road, the sole London agent, is showing the New Hudson motor bicycle, fitted with $1\frac{1}{2}$ to $1\frac{3}{4}$ h.p. engine; surface carburetter, accumulator, petrol and lubricating oil being kept in one case. The driving is by a hide rope. Two brakes, back Bowden and front brake made by the New Hudson Co., and named after them being fitted to the front rim. The lubrication is by a pump. The machine has a very neat appearance, with the supply tank painted aluminium colour.

Werners.—The new 1902 pattern sold in this country by Messrs Werner Motors, of Woodstock Street, Oxford Street, W., are shown in the bay. The English built Werner is a new introduction, selling at £50, having two brakes, and the workmanship being of the highest quality. The French made machines are now fitted with the Morrow hub and a substantial front rim brake. The coil is of a new pattern with no visible terminals and lubrication of the engine from the saddle is now provided for. The method is absolutely reliable and it is not possible to miss the charge of oil. The contact breaker is new, the cam having no notches and no projections, but having instead a flat on it; the trembler blade is also minus projections. The result is an excellent trembling contact. The Werner with its vertical engine, large comfortable tyres, wide flat band and its many details that make for simplicity and efficiency, is a machine that will prove immensely popular during the coming season.

Phoenix motor bicycles make an exceptionally interesting display because J. Van Hooydonk has made a careful study, not only of the requirements of the motor cyclist, but of the possibilities of the motor itself and has adapted the latter to the former. We have already given many details of the Phoenix, notably the spare petrol tank, the efficient system of lubrication, the exhaust valve lifter, and a clearance from the handlebar and frame of all wires. The contact breaker is now and extension of the lever which lifts the exhaust valve rod and is operated by the lever on the handlebar. Recent improvements consist of the adoption of long levers to the gas



THE "PHOENIX" TREMBLER ADJUSTMENT.

and mixture taps to secure fine adjustment, a simple clamp for the trembler blade so that this latter can now be easily adjusted and readily renewed, and a simple device for preventing the oil from splashing out of the crank chamber through the pressure vent. The spring head and spring seat pillar have largely added to the comfort of the machine. It may be said of the Phoenix that good points can be found on every inch of it.

The *Holden* is the only motor made with four cylinders entirely water cooled. It is a slow speed engine of 3 h.p., and reliability has been consistently aimed at. The carburetter is of the surface type and lubrication is automatically performed when engine is running, ceasing as the latter stops. The engine drives on to a wheel, 16 inches in diameter, but despite the small size, no discomfort is caused to the rider sitting midway between the wheels. Complete control is obtained without the need for moving the hands from the handlebar, and other troubles such as overheating, faultiness at plug and so forth have been entirely prevented. The engine develops ample power to carry the rider to the top of any hill without any demand for assistance from him. A careful study of the *Holden* soon convinces one that worry and petty annoyance in the management of it have been almost abolished.

The *F.N. Bicycle* is also shown by this company. This engine is made by the *Fabrique Nationale, Herstal, Liege*. We can state that the turn-out of this engine is worthy of the name of that celebrated engineering works. The engine is of the outside fly-wheel type, the latter being on one side of a large central bearing balanced by the cylinder and single disc crank on the other. This insures, perhaps, the lightest construction possible for small engines. It is securely attached to down seat tube. Transmission is by belt. The carburetter is neatly arranged under the top horizontal tube. This motor should appeal to the lover of the neat and compact; it is of 1½ reputed horse power.

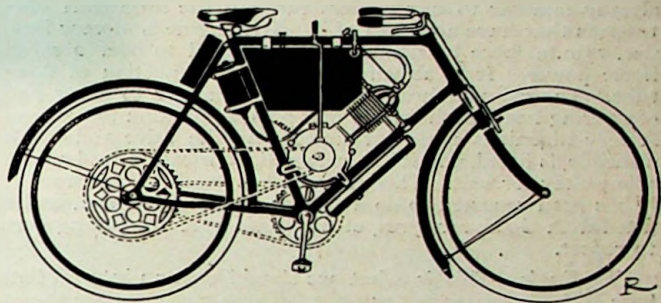
E. M. Bowden's Patents.—The exhibit made by this company is bound to have an immense influence on the controlling fittings of motor bicycles, in much the same manner that the *Bowden* wire for brakes has made its mark for simplicity. The *Minerva* pattern motor exhibited has all its ignition, carburetter, exhaust valve lifter, and last, but not least, the friction clutch by which the chain drive is conveyed from motor to driving wheel worked by levers and wires on the *Bowden* principle. The *Bowden* friction clutch enables a ½ in. pitch chain to be used as a form of transmission instead of the belt and yet provides a means whereby a certain amount of slip can take place when the jerks are apt to occur. The clutch is fitted upon the back wheel axle, and when thrown out of gear—for descending hills, &c.—the chain is at rest.

D. Citroen & Co.—The well-known "*Minerva*" motor, fitted to various frames for riders of both sexes. All the latest improvements dealt with already in part when

describing other stands where *Minerva* motors are fitted, are found. Those who wish to become thoroughly *au fait* with the engine and its parts should spend some time in examining the sections shown.

We illustrate the new *Minerva* tandem attachment. This device can be fitted on to any motor bicycle in a few minutes, the uprights springing on to the rear axle and being locked by the nuts, whilst the saddle bolt holds the forward end. The attachment should prove very popular.

Principes Autocar Co., besides showing a smart 4 h.p. *voiturette*, are also exhibiting a chain driven motor bicycle, with diagonal engine fitted within the frame, sight feed lubricator, either spray or surface carburetter can be fitted. The front brake on first being applied breaks the electric circuit, and with



THE "PRINCIPES" MOTOR BICYCLE.

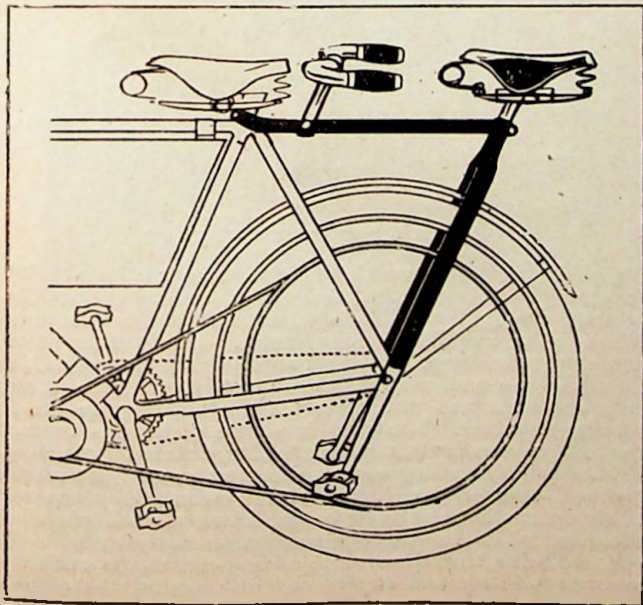
further application the brake acts on the front rim. The engine is 1½ h.p. and is free running, the engagement being by a gradual clutch. The accumulators are for 20 amperes hours and the petrol capacity for 120 miles. The price listed is £45 net.

Alfred Dunhill is making a most effective display of garments for owners of cars.

W. King & Co., Cambridge, exhibits one of the highest-powered motor bicycles in the show, viz., a 2½ genuine *De Dion* motor, which is thoroughly well attached behind the bottom bracket; the bottom of crank case rests on lower back fork stays. A large central case contains surface carburetter, coil, batteries and lubricant. The finish of these machines is admirable and they should appeal strongly to "speed merchants."

S. Smith & Son, Ltd., make a most attractive exhibit of their justly celebrated watches and chronometers. So far, the needs of those owning cars have been catered for in the direction of suitable timepieces and speed indicators, but now attention is also to be paid to motor cyclists and their requirements. A new chronograph with a large flying second hand to facilitate the calculation of speed between milestones and so forth is already on the market, whilst a special speed indicator at a moderate price will be ready for the cyclist in the course of a few weeks.

Excelsior Motor Bicycles, amongst the very earliest of the popular pattern to be put on the market, are now enjoying a well-deserved popularity. The samples on view exhibit many improvements, such as the new anti-vibrating spring head, an exhaust valve lift and other requirements. The lady's bicycle is well designed to give ample dress clearance, and the rider and her costume are well guarded against mishaps. The *Excelsior* 2½ h.p. motor bicycle is a speedy vehicle out of which forty miles an hour has been obtained. The engine is air cooled and entirely English made. It is fitted with exhaust valve lifter, substantial contact breaker, large exhaust pipes and an excellent system of gravity feed lubrication. The engine also has bearings of an ample size. The frame of the cycle is extended so as to give room for the larger engine; a larger wheel base is thus given. The machine has been put to its paces on the track, and has proved fast and satisfactory. For hauling a trailer ample power is provided. *Excelsiors* are running in the grounds, and create a good impression.



THE "MINERVA" TANDEM ATTACHMENT.

C. R. Base has laid himself out specially to cater for cyclists, motor cyclists, and owners of cars in the matter of tailoring and outfitting. His premises at 309, High Holborn are very central, and he is equipped for rapid execution of orders.

McCurd's instantaneous motor bicycle supports are devices which will prove an inestimable boon to bicyclists and tricyclists. The support for the three wheeler was shown at the Stanley. That for motor bicycles is shown at the Palace for the first time; it consists of two pairs of collapsible legs, which hang from the chain stays, the idea being to leave them as a permanent attachment so that roadside repairs can readily be undertaken. Mr. McCurd, of 21, Clapton Square, N.E., will send full particulars on application.

Davis, Allen & Co.—The Mitchell.—This machine is perhaps already familiar to our readers through the numerous illustrations that have appeared of it. The engine is of very large size, 75 m.m. bore by 90 m.m. stroke, equal to over 2 actual horse power. It is attached to the upper portion of down tube. The cylinder head is in close proximity to lower part of steering head, perhaps the best possible position for cooling. A very ingenious spray carburetter, on the valve and needle principle, is fitted, and it has automatic lubrication, and adjustable jockey for belt. This machine has much to commend it. It has been reported to do a mile in 1 min. 6 2-5 sec., and is fitted with Goodyear tyres, of which we have everything good to report.

The Eagle.—This is what we should style an intermediate type of high power motor cycle. Three machines are shown up to 8 h.p. (genuine De Dion). The first thing to strike the observer's eye is that a single driving wheel is used, Olympia Tandem fashion. This is chain driven, Renolds' constant pitch silent chains being used. Two speeds are provided by an ingenious system. The two chains on either side of driving wheel are geared, one for high and one for low speeds. The sprockets actuating these are fitted on a secondary shaft between engine and back wheel. These sprockets have internal friction clutches, so that either can be put in by means of a simple sliding cam and clutch actuated by a lever on left of driver. When the lever is in mid position, the engine is freed from transmission, and can be then easily adjusted before starting; on a long down grade the cycle can be allowed to run freely.

The Rex.—This company shows three bicycles and two light cars. Of the bicycles, two are of the older pattern with the motor inclined. The 1 1/2 h.p. engine appears to be a thoroughly well designed and manufactured piece of work. The carburetter of the surface type is of large capacity and easy manipulation. Only one handle controls the speed, starting, &c. The cooling rings are square in shape, and of large surface—a strong point—and the plug, paced in the best possible position for same, viz., centre of cylinder—is used. A combined current interrupter and exhaust valve lift is fitted and the frame is of excellent finish and the motor attachment of the most thorough description.

The new pattern will create widespread interest. The engine and fitment are of similar pattern to the foregoing. A special point is the strengthening of the front fork which is of that double variety known as the cow-catcher pattern; a large lubricating pump is attached in convenient position, and a Bowden brake to back wheel provides efficient stopping power. An extremely efficient silencer or exhaust box compares favourably with the "pepper caster" pattern of recent fashions. The interested reader should make a point of studying this machine most carefully, as it marks a strong step in the gradual perfection which we are attaining in the motor engine. And every item is of entirely English manufacture.

An illustration of the new "Rex" has to be left over until next week.

The Primus Bicycle motor is of the De Dion type, of 1 1/2 h.p., and is designed to be fitted in front of the steering head. An ingenious method of altering the gear, by using two rollers of different diameter to drive through, is shown. We may illustrate the idea in our next issue.

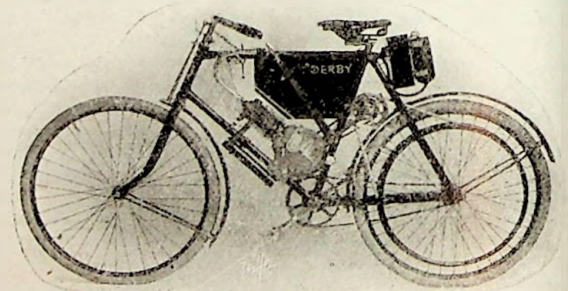
Humber, Ltd.—Broadly speaking, two types are shown. The "Humber" Minerva appears in two grades at £45 and £55. Believers in the belt drive are catered for in this machine and a special point is that the brake power is exceptionally strong, a back pedalling pattern being provided in addition to the usual front rim type. The fittings follow the usual Minerva lines. The valve lifter, timing, and mixture are being manipulated from the handle bar in Beeston pattern, which is also fitted with spring head front forks.

The Humber chain driven motor bicycle is certainly one of the features of the show. Four T stays form the down tube from head to bracket; the cylinder is arranged centrally in the same plane with these, the four stays acting and occupying similar positions and functions to the four stays securing engine in air cooled De Dion engine. We illustrated this machine last week.

The United Motor Industries, Ltd., besides exhibiting very large stock of all classes of motor accessories and fittings show the Chapelle motor bicycle which has the excellent recommendation of being a two speed one. The engine is all a free one, and in descending long hills, with engine thrown out, the economy of petrol must be large. The changing is neatly arranged and can be done whilst riding. Another advantage claimed by this gear is that being able to throw the engine out, the machine can be pedalled at once without having to take the belt off. It is well made, with vertical engine. The special carburetter gives a constant level for petrol and is automatic in its action.

The ignition is by either dry batteries or accumulator which are fitted in a leather case and attached to the frame. The belt is tightened by a lever at the side of machine and adjustable at the will of the rider.

Derby Motor Bicycles are now shown in three or four different types. As an alternative to the friction transmission, where the driving power is applied to the back wheel by means of a roller running on the tyre, a new pattern is shown where belt driving is utilised. In place of the roller a groove pulley is used, and this pulley which carries the belt can be moved nearer to or further from the rear wheel by means of the lever which has always been a feature of the Derby.



THE LATEST DERBY BICYCLE.

Precision Co.—This well-known Northampton firm exhibit for the first time, and their show fully realises our greatest expectations. The chief interest lies in the motor which is a marvel of compactness. The points in it are extremely large phosphor bronze bushes to engine axles. The flywheels and crank axles are cast in one piece of steel, only one joint and nut being used in building up the front wheel and crank. The plug in centre of head is certainly the best position for this and for the large diameter of valves.

The small pulverising spray carburetter is amongst the really practical ones of the show, it being actuated by the suction of air on suction stroke of piston, lifting a small pin which allows petrol to flow through small holes in the sleeve of the pin, and being thus drawn into mixing chamber is caught in current of air and carried violently against the edges of mushroom valve attached to top of petrol pin; this insures its complete pulverisation, and we expect good reports of it.

HINTS AND WRINKLES.

A RELIABLE speed indicator on the handlebar of a motor cycle would be a most useful addition. Does such an article exist?

WITH a motor bike on "greasy" roads don't jamb on the brake suddenly; the wheel may lock and a nasty fall result.

If a trial run of an engine on a stand is indulged in indoors, these cold times, don't expect the engine to start work on the same mixture in the open. It will require considerably more gas.

To Prevent Jumping.

It may happen that in wet weather the spark will jump over the porcelain of the plug owing to the rain and very damp air. A good plan to prevent this (in an emergency) is to smear outside of plug with solution; fasten a piece of patching rather tightly round plug with solution. It is not a bad plan to fit a piece of rubber tube tightly over the whole plug.

Ignition Tips.

NEVER even for an instant leave your electrical connection *in situ* after the engine is stopped, and don't switch on before you are going to start engine. Do both these simultaneously. Both means "short circuiting" and that is something like emptying a barrel of water by knocking the bottom out. An accumulator can discharge its full complement of Volts, amperes, &c., in about 30 secs., and undoubtedly it ruins itself at same time.

Don't Advance Spark.

If your engine seems to slow uphill, don't attempt to increase power by advancing spark. The spark must be adjusted to speed of the engine not *vice versa*. Generally speaking, in traffic it is better to control by cutting out either switch or with valve lifter or both—keep sparking about medium. It is not generally known, but to continually alter sparking knocks the engine about considerably. Always adjust your sparking very gradually to speed of motor.

Lubrication.

IN the present prevailing frosty weather a thinner lubricant is advisable. We have twice been "stuck up" this winter from a "jambed" piston, owing *not* to there being insufficiency of lubricant but to the latter becoming either congealed or too thick to be splashed by the crank. A very light modicum of paraffin will help considerably, and it is advisable to give the cylinder a cleansing with paraffin after jamming in this way.

Satisfactory.

ONE of ours has for some time had trouble with his machine, owing to the fact that oil has forced itself out of the non-return valve in the crank chamber screw, and found its way into the trembler case. Various methods have been tried with a view to obviate this trouble, but on mentioning the matter to Messrs Bayliss, Thomas & Co., they stated that they were now fitting screws with valve holes much less in diameter, and very kindly supplied us with one.



A FINE BURST OF SPEED.

Judging by the manner in which the dust is flying one feels some doubt as to whether the legal limit is being strictly observed

CONGRATULATIONS!

The letters or extracts from letters given below indicate pretty conclusively how "Motor Cycling" has met with the approbation of the press, the taste of the public, and the appreciation of the trade. Those printed are only a small portion of those which we have received.

WHAT THE PRESS SAYS.

The **PALL MALL GAZETTE** thinks it a wonderful pennyworth.

Though still in its infancy motor cycling is to have a journal exclusively devoted to its interests. The journal, indeed, has already made its appearance. We have before us "No. 1, Vol. 1," and very well it looks. Among the contents are articles of a most instructive character. Mr. Anthony Westlake deals with the motor cycle from the historical point of view, Mr. Ernest H. Godbold waxes enthusiastic over the delights of motor cycling, and there are contributions of a technical nature which cannot fail to be of value to those who are already, or propose to become, motor cyclists. The number is well illustrated, and can only be described as a wonderful pennyworth. *Motor Cycling*, for that is the name of the newcomer, is conducted by Messrs. E. Dangerfield and W. Groves, and is to be published every Tuesday.

The **DAILY NEWS** thinks it substantial.

Motor Cycling.—Under this title a new weekly paper has been started which is to be exclusively devoted to this latest development of the wheel man's recreations. No. 1. is a substantial paper presenting a large variety of articles directly and indirectly bearing on this subject, and illustrated with numerous pictures. It is published by the proprietors of *Cycling* (Temple Press).

The **DAILY MAIL** is interested.

Motor Cycling is the name of a new paper published this week for the first time in the interests of motor cyclists. It is full of bright, readable articles and general information, and is excellently illustrated. The new paper, which is issued from the offices of *Cycling*, contains much that will prove of interest to car owners, as well as cyclists.

The **BIRMINGHAM MIDLAND EXPRESS** doubts not its value.

"I have received the first issue of *Motor Cycling* which is published by the proprietors of that most interesting of journals relating to the sport and pastime, *Cycling*. The journal is excellently produced, and the contents are thoroughly interesting. If the quality of letterpress and illustrations evidenced by the first number can be maintained, *Motor Cycling* will become popular, and will unquestionably prove of value to the followers of this important phase of cycling."

The **DAILY EXPRESS** considers the pastime established.

"Motor cyclists now have a paper to themselves. The first number of *Motor Cycling*, an off-shoot of that excellent weekly *Cycling*, has just been published.

From the quantity of news and illustrations, to say nothing of the advertisements, it is evident that the new pastime already stands high in popular favour.

The **IRISH WHEELMAN'S** kindly wish.

"Accept my hearty congratulations on the first issue of *Motor Cycling*. It is one of the neatest motor publications I have yet come across, and needless to say I wish it every prosperity. I trust it will become as great a power in the world of motor cycling as *Cycling* has in the kindred pastime."

The **LEAMINGTON SPA COURIER** is optimistic.

"We give hearty welcome to *Motor Cycling*, a strong and lusty youngster, an infant Hercules. If we have so much excellence in the green—no allusion here to the wrapper—what may we expect when the sapling grows into the solid oak of such a tree as its elder brother *Cycling*? *Motor Cycling* will doubtless meet with rivals as time goes on, but it will be the parent stem, and all fresh comers, with their varying successes, but imitations and offshoots.

"The new weekly has apparently been produced regardless of expense. It is printed on excellent paper, with the latest type, and illustrated by expensive diagrams and reproduced photographs. The success of *Motor Cycling*, we venture to predict, is assured."

GRIFFIN regards it as a record.

H. HEWITT GRIFFIN.—"Hearty and sincere congratulations upon your splendid No. 1. I have had a good deal to do with Number Ones in my 28 years' journalistic experience—but this is a record issue for anything connected with cycling or sport of any kind."

WHAT THE PUBLIC SAYS.

H. E. TREW (Bristol).—*Motor Cycling* is A1.

E. S. BRAME (Sidcup, Kent).—"Congratulations."

T. F. EGGLETON (Southgate).—*Motor Cycling* is first rate."

C. A. SMITH (Cobham).—"Congratulations you on No. 1. It should 'spark.'"

W.B.C. (Leyton).—"Motor Cycling awaited and devoured with interest. Every success."

J. A. LEWIS (Ipswich).—"Undoubtedly a good value for one penny; was pleased with it."

C. G. SHORE (Croydon).—"Really a magnificent and instructive paper. I wish it every success."

J. BUTLER (Portman Square, W.).—"Must congratulate you on the first number of *Motor Cycling*."

H. W. PARKER (Royston, Herts.).—"An excellent paper. I trust to remain a constant and permanent subscriber to *Motor Cycling*."

F. M. GOULD (Holland Park, W.).—"Allow me to congratulate all those 'who had a finger in the pie' in producing such a grand magazine."

F.S. (Arundel Street, Strand, W.C.).—"Many congratulations on the first number of *Motor Cycling*. It is extremely interesting and useful."

HENRY BETTS (Birmingham).—"Congratulations on your new venture. The first number is absolutely unique. I venture to prophesy that this journal will be the most popular of any similar journal on the market."

F. J. PEPLow (Librarian, Dulwich Library).—"Allow me to compliment you on the excellence of your venture, which will, I have little doubt, be recognised as the representative journal on its subject, just as *Cycling* is *facti princeps* on its own."

G. SHAW SCOTT (Sutton Coldfield).—"I was with great pleasure that I was anticipating the receipt of *Motor Cycling* this morning. How much greater was my delight at amazement when I received the delightful bulky package which the post brought."

I must congratulate you on the excellence of the new paper. It is much better than I had expected in everyway—style, illustration, paper, size, advertisements, and reading matter. *Motor Cycling* undoubtedly deserves every success and I shall do my best to obtain many new subscribers. Wishing *Motor Cycling* all success in the future.

WHAT THE TRADE SAYS.

ENFIELD CYCLE CO., Ltd. (Ernest H. Godbold).—"Have received No. 1 of *Motor Cycling*, on which I hasten to congratulate you. **EADIE MANUFACTURING CO., Ltd.** (Frank Baker).

"The paper realises all our expectation and it will evidently set a pace hard to follow. **RALEIGH CYCLE CO., Ltd.** (G. P. Mills).

"Many thanks for No. 1. I consider a most interesting number."

THE NEW PREMIER CYCLE CO., Ltd.

"We are glad to learn that your new publication, *Motor Cycling*, has met with such success."

STRETTONS, Ltd. (Cheltenham).

"Congratulations you upon the first issue of *Motor Cycling*. It quite fulfills our expectations, and we feel sure it will be the recognised organ of the motor cycle trade just as *Cycling* is of the Cycle trade."

THE HUDSON CYCLE CO., Ltd.

"We congratulate you on your first number of *Motor Cycling*—we consider it will be an immense incentive to the pastime of motor cycling, a most valuable paper to motor bicyclists, and a most valuable medium for advertisers."

BRADBURY & CO., Ltd. (W. L. Carrille).

"I received the first number of *Motor Cycling*, and congratulate you upon it. It is really a wonderful pennyworth, and the best first number of any kind of journal which it has ever been my experience to see. It promises to be equally as good as *Cycling*, and I think this is sufficient praise."

OTHER PEOPLE'S VIEWS.

SUGGESTED IMPROVEMENTS.

SIR,—Perhaps the following remarks on the subject of the future motor bicycle may help the discussion thereon a step further.

A motor bicycle may roughly be divided into six parts, viz., the frame, the motor, the ignition, the carburation, the lubrication, and the transmission gear.

THE FRAME.

There can be no question that it is better to have a frame designed for the purpose of carrying a motor than to merely hang an engine to the present type of diamond frame, and to my mind there is no doubt that within a short period the "small man" will have at his disposal a choice of frames by the big makers designed specially to carry a motor. A good example of what I mean is the frame of the Hewetson, or the new pattern Werner. All the refinements which have of late been introduced into the ordinary machine—for instance, spring frames and two speed gears—will be found to be necessary, and of course the two-inch pneumatic tyres will replace the smaller type now in use for ordinary machines.

There are several tyre treads made which are almost unwearable and unpuncturable now in use on motor cars. I refer to the Lovelace and the Wickinson treads—and as these also are claimed to minimise side slip they, or their type, will have to be adopted on the perfect motor bike.

It is a difficult thing to repair a puncture on a heavy motor bike, and this suggests the need of a support which should be light and easily adjusted for enabling the machine to be repaired while in an upright position, with either wheel clear of the ground. Such support would have the additional advantage of enabling the motor to be examined in motion *en route*, which is practically impossible now. I see no difficulty about such a device. All that is required is a rod on the telescopic principle hinged to a clip on each fork both back and front. When out of use they could be folded back against the forks and secured by a spring clip the same as a pump clip.

THE MOTOR.

This should be designed specially for simplicity, and of course should be made as "fool-proof" as possible. Its power should be ample—personally I think 2 h.p. (not nominal) is the thing, and it is what I shall insist on when next I buy. The motor should be able to take all ordinary hills without any labour, and should also be powerful enough to drag a trailer.

THE IGNITION.

I can only condemn electrical ignition. It has so many ways of getting out of order that I think it would be difficult to find any piece of mechanism with more points of possible failure. Everything can go wrong—accumulator, coil, wires, plug, switch, and it is only a question of time for all electric ignition to go the way of all complicated things. It must give way to a mechanical igniter such as is found on the Simms' engine or Hewetson's. In fact, it is a moot point if it has not already received its death blow; for if Wydts Catalytic ignition plug does what is claimed for it, who would be bothered with electrical ignition for another five minutes?

THE CARBURATION.

The tendency of carburetters seem to be in the direction of the spray type, but I am by no means sure that this is as good as the

float feed. The only advantage that the spray has, is its diminutive size and cheapness. But I do not think either of these types will survive, for they have both the disadvantage that the mixture has to be found while the machine is in motion. The automatic carburettor which needs no mixture tap is the thing. Such a one is to be found on the F.N. machine, and is indeed a beautiful bit of work. All that is necessary is to turn on the tap and the motor cyclist can forget that there is such a thing as a carburettor in the world.

THE LUBRICATION.

This should undoubtedly be automatic—lubrication should start with the first movement of the motor and cease with the movement—all automatically. I have seen such a system on a French machine.

THE TRANSMISSION.

It is sufficient for me to ask why we do not drive an ordinary bicycle by belt gear to condemn belt driving for motor bikes. So soon as the difficulties are got over we shall hear no more of belts. The Humber people have got over it and so has Mr. Hardy—the maker of the Martini machines. Both these firms have adopted a system of free wheels, which gives everything claimed for the belt, viz., elasticity, without a single disadvantage of the belt. It has the further advantage of being absolutely automatic. I also hear that a famous chain-making firm—Garrards to wit—are at work on a chain drive which gives a two speed gear on the motor shaft.

TO SUM UP.

A motor bicycle with automatic carburation, mechanical ignition, chain-drive, two-speed gear, automatic lubrication, would be just as easy to manage as a safety bike of to-day. There need be only one tap—to regulate the speed—and that could be attached to the handle bar—so that the machine could be driven without removing the hands from the handle bar grips.

I venture to hope that a machine embodying all the improvements will be on the market before the year 1902 expires.

Yours faithfully,

ARTHUR GUEST.

MOTOR CYCLING CLUB.

SIR,—I venture to recommend that in one of your early numbers you should insert a list of the motor cycling clubs, with particulars of qualifications for membership, fees, secretaries' addresses, &c. Many inquiries have been put to me on the point, and I know of one such club only.

There is, I believe, room for a readable journal for motor cyclists, and ample scope for filling it with useful notes, descriptions, and criticisms is available to its conductors. The motor cycle is far from perfect, and a good paper will help greatly to improve it generally. I hope, therefore, that yours may lead the van, and, enclosing my card, remain Sir,

Yours faithfully,

"AN ARIEL TRICYCLIST."

A MIDLAND MOTOR CYCLIST'S CLUB.

SIR,—May I ask for a small space in your columns to suggest the formation of a Midland Motor Cyclists' Club? There are, or will be this season, a number of motor cyclists in the neighbourhood of Birmingham, Coventry, and Redditch who, I am

sure, will be glad to join such a body for the purpose of mutual intercourse and support. The Midland Automobile Club, which might have been some use to motor cyclists, appears to have gone to sleep—a state possibly due to an overdose of "trade." If the club suggested above is to be formed, I would propose that the chief officers at any rate be independent people. We should welcome trade men as members, but we do not wish them to "boss the show." Will some of your readers kindly express their views, and say if they are willing to attend a meeting at an early date?

Yours faithfully,

AVONIAN.

IN FAVOUR OF THE TRICYCLE.

SIR,—Your interesting and bright paper will, I am sure, be welcomed by all motor cyclists, but I very much hope you will not lose sight of the fact that, many devotees of the motor bicycle though there be, there are also many who prefer the more cumbersome, but in many ways more advantageous, motor tricycle, and will not expect it to be left out of your columns.

As a constant rider of the latter form of motor will you allow me to give two reasons which have doubtless occurred to every intending purchaser, why, on the whole, the tricycle form is preferable?

1. No dismounting when stationary, and thus a great advantage in traffic.
2. No side-slip, and thus no probability of an unexpected fall and broken engine.

Against these, I will put in favour of the bicycle:—Three wheel tracks and thus increased vibration owing to the monstrous way in which the roads in the Metropolis are kept.

My longest ride in the day was from Hampstead to York. I took twelve hours' actual riding, but the time would have been better but for the unfortunate fact that I chose the very day for my ride on which the drought in Yorkshire came to an end, I think the 15th October, the last 80 miles being in rain, and also on leaving Doncaster I took the old and hilly coach road by Tadcaster, instead of Selby.

Yours faithfully,

W. GLYNES BRUY.

{Our correspondent and others may rest assured that we shall not overlook the motor tricycle by any means in our columns.—Ed.}

[A number of interesting letters have been crowded out this week.]

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A GOOD TEST.

It is popularly supposed that a 1½ h.p. engine will not take an ordinary rider up a stiff gradient, but on Thursday, when in Coventry, we had ocular proof as to the fallacy of this statement. Just as a test Mr. Bayliss, jun., free-wheeled down the bottom part of Bishop Street, turned at the foot, and at the same time started the engine of his machine. Without the slightest sign of a "miss" the engine took him up Bishop Street and right to the top of St. Nicholas Street. The hill is not particularly steep, but it is of considerable length, and it must be remembered that the engine was not working until the machine was actually ascending the hill. It was a good test.

OUR INFORMATION BUREAU.

G. BISHOP (Cologne).—Subscription duly received for "MOTOR CYCLING."

LIEUT. COL. MILNE (Bombay, India).—Will be duly sent to you. Thanks.

W. G. BLVIS (Cawnpore, India).—Glad to number you among our subscribers.

H. GOODALL (Agra, India).—Duly received your subscription. Hope you will like No. 1 when it arrives.

H. A. (London, E.C.).—We advise you to get the Phoenix motor bicycle. Thanks for year's subscription to "MOTOR CYCLING."

The New Werner.

J.S.C. (Tullow, co. Carlow) writes to say that he has gone carefully into the matter of motor bicycles, and has come to the conclusion that the New Werner is about the best. "Will you, or your readers, kindly oblige," he asks, "by informing me through your columns what the faults are, if any, in the latest type of Werner, as I am sure this question will interest more readers than myself?" The New Werner greatly pleases us theoretically speaking, but, so far, we have not had an opportunity of testing this type of vertical engine and spray carburetter.

Fitting a Motor.

P.G.S. (London) has nearly decided upon the "Excelsior" motor bicycle, "as being about as good as any." Get one. Our views upon fitting a motor to an existing machine are as follows:—It is essential that the head be suitably strengthened, and that the clearance be ample for two inch tyres, while the down tube, stays, &c., should be heavy gauge. With these points to be considered we cannot recommend a motor to be fitted to your machine as it stands. The engine referred to is not identical with the Minerva, but is on similar lines.

FORRESTER BRO. (Stenhousemuir).—We are making a practical acquaintance with the Precision Motor at the Show, and give our opinion in another part of the paper, and shall doubtless have more to say on the matter after a trial. Theoretically, it appears excellent. The makers are the Precision Motor Company, Northampton.

A Matter of Conversion.

"FOOTBRAKE" (Clapham, S.W.) has a Triumph cycle-chair—rear driving, front, steering (both wheels), 2in. Beeston tyres foot brake, strong machine—and he is contemplating having it fitted with a motor, if the cost is not paralysing. He only requires a motor which will give him a speed of eight miles per hour on the level, and assist him in mounting hills. The weight of passengers would be 13 stone in all. We advise him to try and get a De Dion motor second-hand at least 1½ h.p., for it is uphill that the strain will come. But we doubt whether the conversion can be made under £35.

Compression and Carburetter.

T. W. THEW (Bradford), is thinking of placing an order with a local firm for a motor bicycle built with a "Pieper" engine. "Would you tell me," he asks, "whether the Pieper firm are well-known manufacturers, and whether the engine would be likely to prove satisfactory?" Yes, they can be recommended. Question No. 2 runs thus:—"Would I be wise to insist on having an exhaust valve lifter fitted, instead of or as well as the compression tap lever?" Have the exhaust valve lifter by all means. And finally comes No. 3:—"Is the ordinary surface carburetter good enough, or would you advise a spray carburetter?" So far as our experience goes we have found the surface carburetter most satisfactory, but there are good spray types, too, on the market.

Visiting the Show.

E.G. (York).—If you visited the Show fairly early on Saturday, you could see the inside exhibits and the motor cycling races on the track and in the grounds. There are 'busses running, but perhaps you will get there quicker by train. You ought to do the Show in one day.

Motor Bicycles in Hyde Park.

"FIFTEEN SHILLINGS" (Strand, W.C.) sends along the following interesting letter. Perhaps some of our readers can throw some light on the matter:—"I rode through Hyde Park on Wednesday, about five o'clock, and was going out at Marble Arch, when I was stopped by a policeman who informed me that motor bicycles were not allowed in the park till 7 o'clock. Can you tell me if this is correct? I understood that as the motor bicycle is subject to a 15s. license it was a motor so far as the Hyde Park rules are concerned, and I would be obliged if you could tell me whether I am right or wrong. The 'man in blue' was quite civil, and suggested I should make a test case of it, but this I am not prepared to do, as under ordinary circumstances the 'going' on the wood pavement of Park Lane is distinctly better than the macadam inside the railings."

Answers will appear under this heading, and will be a special feature. Information on all subjects pertaining to Motors, Motor Cycles, and Motoring generally, will be given to readers who seek such information or advice. Any reader who desires to ask a question with the view of ascertaining the views of other riders based upon actual experience should send his query which will be inserted, and replies to such questions will duly appear.



A HOPELESS APPEAL.

"Hi, guv'nor, 'ave yer got a drop of oil on yer"?

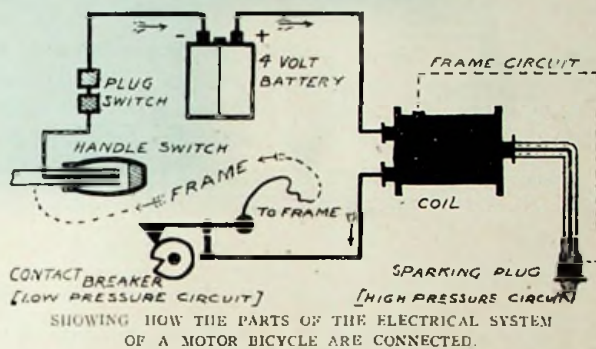
THE ELECTRICAL DETAILS OF THE MOTOR BICYCLE.

Part II.—How the Ignition System is connected together. How to charge the accumulator from an electric light installation. Defects in the Coil. Defects in the Wire. Electrical terms defined.

THE POSITION of the coil and battery varies with the type of machine. In the "Minerva" both are carried in the case fixed in the diamond frame, in the "Werner" the coil is clipped behind the diagonal or seat tube and the battery is carried in a separate compartment of the petrol tank. Some American types of motor bicycles have the battery slung or clamped behind the saddle. The positions of contact maker, switches and sparking plug are practically the same in all types. Now, looking at the diagram, it will be seen how the wires are run to the various parts of the system. Starting at the + or some positive pole of battery, a wire goes to one of the primary terminals of the coil, from the other a wire is connected to contact switch of trembler or make and break, and the spring is directly in contact with frame of bicycle—this, of course, conducts the current through handle-bar to the switch where the wire circuit recommences, is broken at plug switch and goes on again to the negative pole of battery. Then the other circuit, which may be regarded as quite independent and not connected with the other one, consists of one *thickly insulated wire* from the single terminal of coil to sparking plug direct.

The other end of secondary coil makes contact through one of the clips to the frame, so that even in this circuit we have a "frame" return. WHY IS THE FRAME UTILIZED AS A CONDUCTOR? From a purely electrical point of view it would be more correct to adopt an "all wire" circuit throughout. This would entail the use of a more complex design of sparking plug, viz.: one with two insulated poles and two thickly insulated wires from coil—which would now have two secondary terminals instead of one; the condenser connections in coil would be different and an extra wire would go to handle-bar switch. So that increased electrical efficiency would entail somewhat of a loss in simplicity of wiring, design of sparking plug, &c., but still it is a fact that this "frame" connection is the cause of a lot of breakdowns owing to short circuits taking place. This frame connection is sometimes termed an "earth." This is not strictly accurate, because the bicycle is insulated by the tyres—excepting when wet a partial "earth" is formed. Charging the accumulator. One of the greatest troubles experienced by the motor cyclist, is: When and how is the battery to be charged? Upon having a store of electrical energy that can be relied on much of the successful running of the motor depends. When the new machine is delivered, the accumulator is supposed to be sent out with a *maximum charge* in it. This is really rarely the case, because the battery requires a considerable amount of use in the way of charging and discharging to get it up to full capacity. After the first 100 miles the battery should be recharged. To do this there are several methods—one being to take it to the depot, another one is to get some user of the electric light to allow you to connect it up to one of his lamps in the following manner: Obtain a small fitting called an "Adaptor" from one of the electrical fitting dealers (this costs about 1/6), also a spare lamp holder (2/-) and a few

yards of No. 18 insulated wire. Make the connections which are clearly shown. The current will then pass through the lamp and battery in "series," and providing you connect the *Positive* of battery to *Positive* of supply and leave on for long enough—known by the battery "gassing" strongly—the charging will be very effectively performed. You will require to find out which is the positive wire of the supply (the positive of battery being always marked with a + or painted red). This is a simple matter. Obtain two scraps of sheet lead, clean them bright and place them in a glass or jar so that they touch each other; then pour into the jar some dilute acid (sulphuric), say, out of the battery—but be sure to put it back; then fasten the wires A and B, one to each lead plate, and switch on the current. In a few minutes the lead plate connected with the positive wire will turn brown and, provided you always put the adaptor into the holder on the same side, this wire will always be positive. Remember, however, that the current supply must be *direct* and not an alternating one.

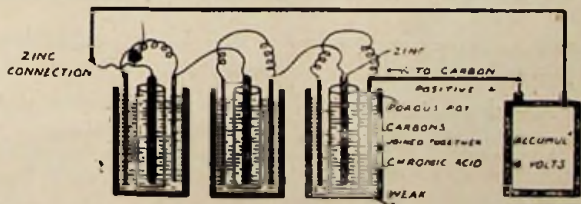


The third method is perhaps the one that will commend itself to the average motor cyclist, because by adopting it he is independent of agents (some of whom ask fancy prices for charging), and he can always rely on his battery being in the best order. The method is the one of charging your accumulator from a good primary battery. This is very easy to construct at home and far more efficient than some advertised with fancy names and prices. The type of battery to make is known as the "Fuller bichromate," which, old as it is, cannot be beaten for giving a strong, steady current for many hours at a stretch. In use there are no fumes given off and no danger from the liquids used.

Three cells will be required to charge a 4-volt accumulator, and you will require the following materials to make them: Obtain three half-gallon stone or glass jars (preserve jars will do), three large porous pots, six large-sized carbon plates with terminals attached, three thick zinc plates rather longer than the porous pots and not quite as wide, so as to go inside them easily, also a few yards insulated wire. Then you require a stock of the following chemicals: 3 lbs. Chromic acid powder, 2½ lbs. strong oil of vitriol, 3 ozs. Mercury: These materials are readily obtainable from a large dealer in chemicals and apparatus (a local chemist might get them, but would charge rather more for them); total cost about 12/6. Having obtained them, proceed to solder or rivet a foot of insulated wire to each zinc plate. These require next to be coated with mercury or "amalgamated" thus: Put a few globules of mercury on the surface of zinc, and then dip a small pad of rag into some weak sulphuric acid, rub the mercury over zinc with this and it will adhere, giving it a silvery appearance. Do this thoroughly, leaving no part uncovered. Now put two carbons in each jar and also a porous pot containing a zinc and join them together as shown in the diagram. Dissolve the chromic acid in 1½ gallons

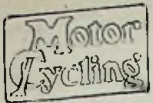
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Method of charging an accumulator by means of a Fuller battery. The diagram shows three cells connected in series. Each cell consists of a porous pot containing a zinc plate and two carbon plates. The zinc plate is connected to the positive terminal, and the carbon plates are connected to the negative terminal. The cells are connected to an accumulator (4 volts).



METHOD OF CHARGING AN ACCUMULATOR BY MEANS OF A FULLER BATTERY.

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water and then add 2 lbs. sulphuric, and it will get warm and must cool before using. Put this mixture in outer jar and almost fill porous pots with water, then add 2 ozs. sulphuric to each. To charge the accumulator, connect positive to carbon, negative to zinc and leave on for about 12 to 15 hours or until accumulator "gasses" strongly or the acid appears milky in color; if you have a voltmeter to test with the two cells should show 4 1/2 volts, or well over 2 volts each when charged. When charging is complete remove porous pots and zincs, till again required (do not leave zinc in the acid). The battery should charge up for about six times before new solutions are wanted.

FAULTS IN THE ACCUMULATOR.

Sometimes the battery will lose its charge on standing for a day or two. This may be due to leakage from terminals, or short circuits inside, due to the vibration of machine loosening a pellet of oxide which falls between the positive and negative plate and conducts the current across, or a plate may have become buckled or distorted and touches its neighbour. These faults are easily detected if your case is made of celluloid. Leakage from terminals is avoided by keeping top of case dry. A good battery will keep its charge for several weeks. Keep the plates covered over with acid of proper strength.

FAULTS AT THE CONTACT BREAKER.

Misfires are often due to bad contact between platinums; keep these bright and firmly touching; if they burn away rapidly it is probably due to too much current passing, or insufficient capacity in the coil condenser. The first you can put right by connecting "8" of No. 20 German silver wire in circuit with accumulator; this will reduce current slightly. The second requires an expert to put it right. Very often a pot of oil splashes on to the platinums, and oil being a non-conductor, breaks the circuit. See that all the wires are clean and firmly screwed to their respective terminals.

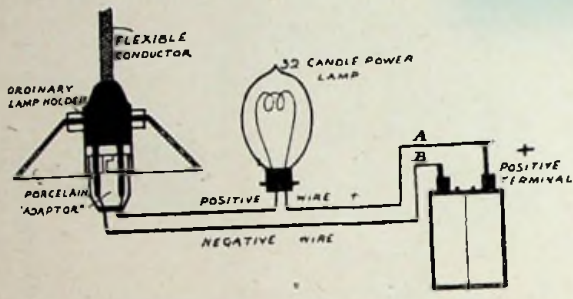
DEFECTS IN THE COIL.

These are very difficult to find, and it is not advisable for the amateur to attempt to take it to pieces. Two things may happen, viz: A broken secondary wire, or internal sparking may take place, due to insulation between windings becoming

perforated or from a short circuit. This may be detected by placing the ear to coil case and moving contact breaker with the finger; the snapping of the spark inside will be plainly heard. Keep the secondary terminal well protected with rubber tape.

DEFECTS IN THE WIRES.

A break in one of the wires is quite possible, although the use of stranded wire minimises it to a great extent. You can find it out by connecting the two ends of the wire for an instant to the accumulator. If you get no spark at the terminals on touching, the wire is broken; don't keep on for more than a second or two, as this test does not improve the battery. The insulation is rather liable to rot in the vicinity of battery terminals, and allowing wire to touch frame or case makes a short circuit. Wrap them well with pure rubber tape well solutioned together. It is very important that the wire leading to sparking plug be of the highest possible insulation, otherwise there is risk of current sparking through on to the frame, as although the coil may not force a spark through it when tested off the plug, yet it will find a weak place in preference to sparking across the compressed gases in combustion chamber.



SHOWING HOW THE ACCUMULATOR CAN BE CHARGED FROM AN ELECTRIC LIGHT INSTALLATION.

ELECTRICAL TERMS DEFINED.

Volts. The unit of pressure or that force which causes current to flow.

Amperes. Unit of quantity of current flowing along a wire or strength of current.

Conductor. A material which allows a current to flow along it readily.

Insulator. A material that resists the flow of current.

Ampere-Hours. A term applied to denote the "holding capacity" for current of an accumulator; for instance, a 1-ampere-hour battery would supply 1 ampere quantity of current for 12 hours, or 1/2 ampere for 24 hours, and so on in similar ratio.

Discharge rate. Means the quantity of current you may safely take out of a battery.

Short Circuit. A path which the current takes in preference to going through the apparatus it is intended to operate.

USEFUL TO BEAR IN MIND.

THE driver has to stop his car if motioned to do so by any person in charge of a horse or by a policeman.

PETROL can be stored without a license up to sixty gallons, kept in metal vessels securely closed and holding two gallons each.

ACCORDING to the regulations, two efficient and independent brakes must be fitted to every motor car, acting simultaneously on two wheels upon the same axle; in the case of a motor bicycle, of course, either brake acts on one wheel at a time.

THE MOTOR TAX.--Motor cycles and cars under a ton in weight are liable to the following duties:--Motor bicycle or tricycle, fifteen shillings per annum; cars or cycles with four or more wheels, two guineas per annum. If used for the first time after October 1st, the duty is half that given in the above list.

THE maximum speed has been fixed at fourteen miles an hour, reduced by the Board of Trade to twelve miles.

"THE Motor Charter" is founded on the Locomotives Highways Act, passed August, 1896, which removed the absurd restrictions in force regarding road vehicles.

So far, no recognised set of charges have been drawn up by the Railway Companies for motor bicycles. On some lines ordinary bicycle rates are charged; on others, double rates are demanded.

It has been generally acknowledged that tricycle and trailing car make a combination, and are looked upon as one carriage. Two cases--one at Portsmouth, and the other at Bath--resulted in the above definition being given, but the contrary view has been held at Chertsey.