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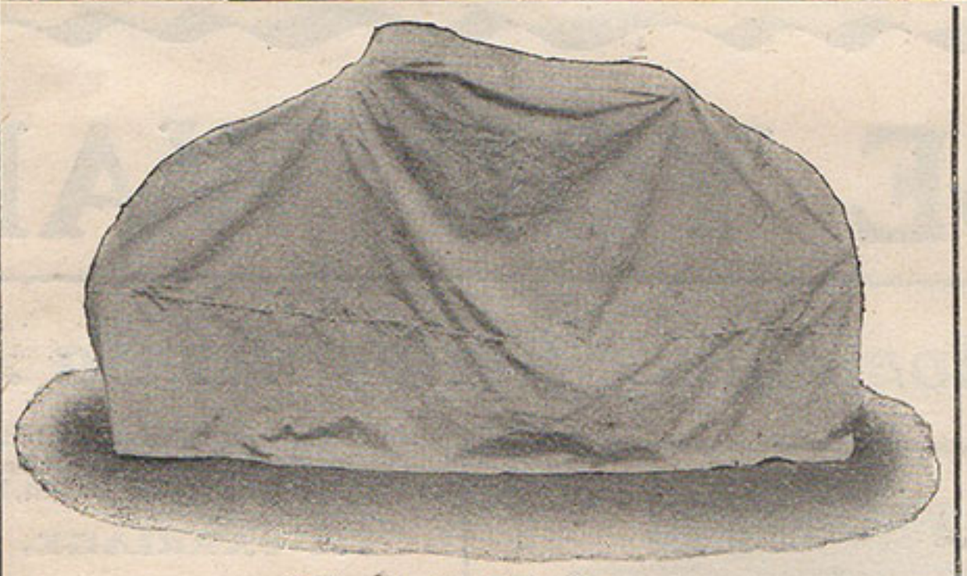
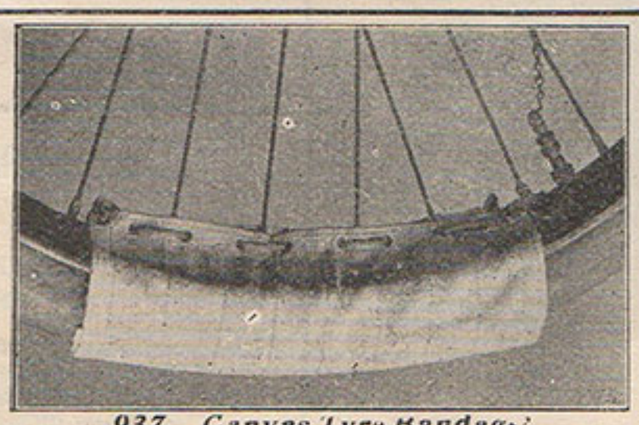
71. Leather Vest.



730. Motor Cycle Cover.



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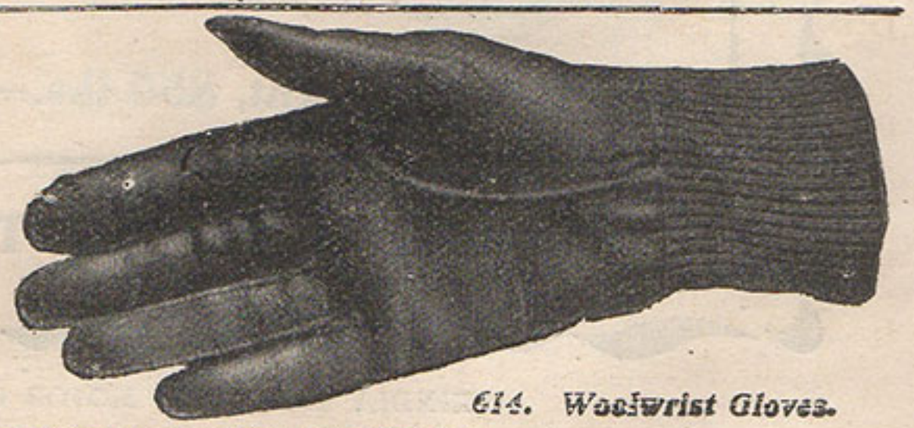


614. Wool-wrist Gloves.

Motor Cycling & Motoring

Vol. 2, No. 42,
November 26th, 1902.

THE LIGHT SIDE.

"*Laugh where we must, be candid where were we can.*"—POPE.

"The Law's a Hass!"

Lights on the rear of a motorcar,
  Flying along the street—
Fastest turn-out on the road, by far,
  Nothing by half so fleet.
Therefore, the Law says a motorcar
Just *must* have a rear-light—so there you are!

Never a rear-light for Aunty Jane—
  No such outrageous thing!—
Plodding along down a country-lane,
  Never a bell to ring.
Once let a motorcar run her down,
And the Law says "ten years, or half-a-crown"!

Never a light on a waggon-load
  Of hay for the market-place,
Lumbering silently down the road,
  Two-miles-an-hour its pace.
That is the reason it's come to pass
That the motorist echoes "The Law's a Hass!"

F. G.

* * *

The Prefect of the Paris Police has discovered such a simple solution of the motor problem. All furious riding in Paris is to be checked by a sergeant provided with a large automobile capable of developing a speed of 50 miles an hour. The streets of Paris will be more than usually entertaining during the operation of this scheme; and if that sergeant does only half of what he is expected to do, he will deserve to be made a major-general at least. *Courage, mes amis! Vive l'gendarme!! Conspuez les chauffeurs!!!*

* * *

If there are degrees in motor-law-breaking in France (as there are in England) it seems to me that that sergeant will inevitably be a bigger malefactor than the man he catches, since he will always have to go just a little bit faster; unless, indeed, he adopts "English" methods, and sneaks up side streets preparatory to pouncing out upon his victim—large automobile and all. But this method might end disastrously for the victim, and I take it that the sergeant's policy will be to catch-'em-alive-o for choice.

* * *

It's a poor law that can only be protected by being broken, and I cannot see how this particular device can be defended. For there is no getting away from the fact that an avenging sergeant, however laudable his intentions, will constitute quite as grave a danger to the public as any other furious rider. If murder became so prevalent and so audacious that the police could only check it by murdering the would-be murderer, this extreme step might plead the justification of an actual benefit to society; but if it does not benefit society to be run down by a motoring civilian, how does it benefit them to be run down by a motoring official? Such a *means* could only be justified by a far more important and well-assured *end* than that which is promised by the Parisian Prefect.

* * *

Prefect becomes Perfect by transposing two letters; but as he stands he is *not* perfect; neither is his scheme. And can the French gendarmerie really spare one whole sergeant for this grave business! The automobile hooligan must indeed be rampant in the pleasant land of France.

* * *

Non-plussed.

"The constable," says a daily paper, "did not answer, and seemed completely non-plussed." "On the return journey," says another daily, "another police trap was discovered near Dorchester. Instead of being captured, the motorists lined up and paraded over the measured stretch at the rate of two miles an hour."

When the stalwart bobby, rising
  Six feet something in his socks,
Glibly tells the most surprising
  Stories in the witness box,
Suddenly a simple query
  Rouses his acute distrust,
And a head, that's far from clear, he
  Scratches, thoroughly non-plussed
When he waits to time the speedy
  Motist o'er the measured mile,
With his flag and stop-watch ready,
  Robert wears a cheerful smile;
But when cars with tootlings cheery-all
  Warned in time, and only just—
Pass him at a pace funereal,
  Robert's thoroughly non-plussed.

* * *

Here is an amusing extract, dealing with our "Manual," from the "Westminster Gazette":—

"'The Motor Cycling Manual,' compiled by the staff of 'MOTOR CYCLING' (Temple Press), is a handbook dealing with the working, construction and management of the motor-cycle in a comprehensive and lucid manner, which should prove useful to many who cultivate or think of cultivating this somewhat *trifling form of athletics!*"

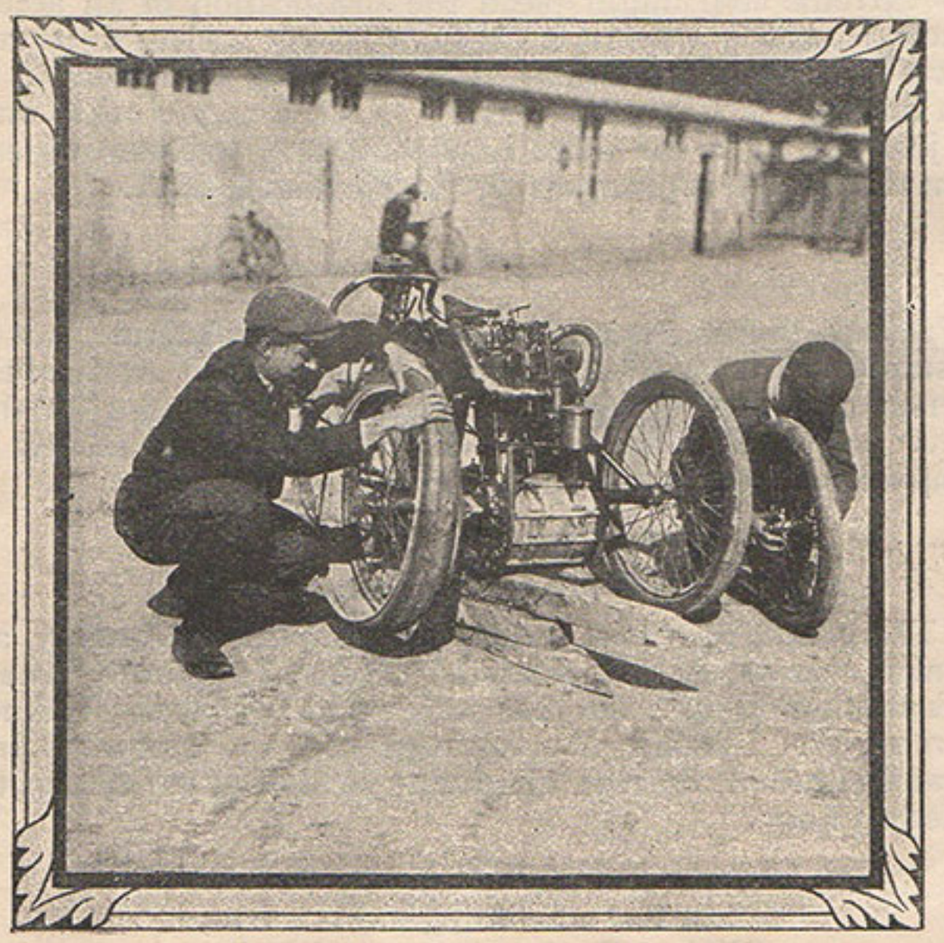
Trifling!

THE RIDING OF A RACING MOTOR-TRICYCLE.

By VICTOR RIGAL.

To ride a racing motor-tricycle? To me this is such an ordinary thing, so habitual, in fact, that it becomes really difficult for me to imagine myself without such a machine. By continually instructing others in the art, I have now come to handle a 16 h.p. tricycle with less apprehension than I was wont to feel when originally I approached a tricycle of a modest 2¼ h.p.

This perfect confidence which I have gained has been helped, no doubt, by the fact that I have had to deal with the most simple form of motor. Nevertheless it is a great trial to the nerves of the strongest to attain to the highest speed of a high-powered motorcycle; but, like everything else, when once the rider gets accustomed to it, he soon gains confidence, and learns to be cool headed under all conditions and at all speeds. But driving and steering a high-powered motor-tricycle on the track is a vastly different thing to driving the same machine



1.—First inspect your pneumatic tyres.

on the road. The banking of the track requires that the machine shall be steered at a certain angle, especially when one is speeding round at the rate of about

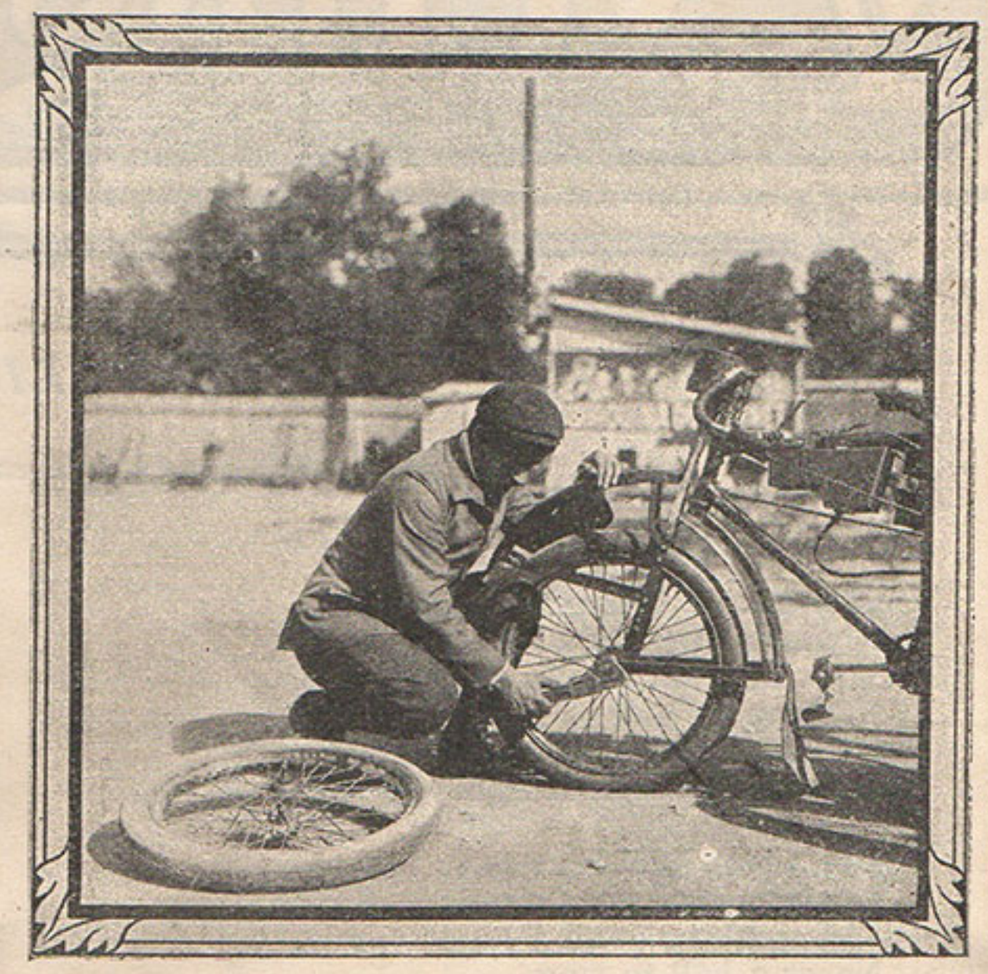
63 MILES AN HOUR.

If the steering at the bends is not very carefully judged, the machine will make what we call in France a "crochet," and the result of that may be that the rider is shot out of the saddle. Bad carburation is an important matter on these high-powered machines, and it is necessary to look most carefully after it, or serious consequences may result. One has to learn to do all the steering with one hand, and to pay unremitting attention to the carburation with the other.

In my endeavour to make readers of "MOTOR CYCLING" conversant with the steering of a racing motor-tricycle of high speed, I may be allowed to mention the following as rules which should be observed if a rider wishes to become expert. It is necessary to become thoroughly acquainted with all the details of the machinery and

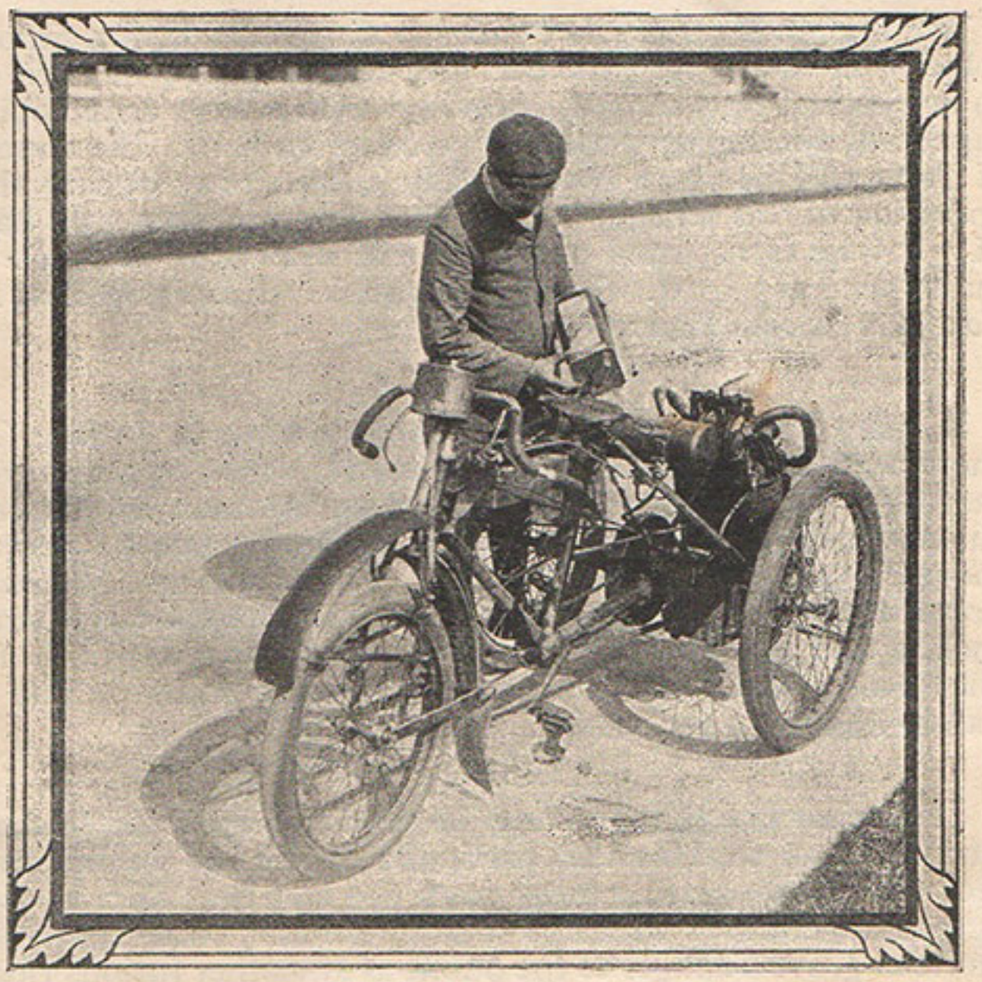
THE PRACTICAL HANDLING OF THE ENGINE

must be mastered. Everything must be studied; not superficially, but with the deepest personal interest, by the man



2.—Carefully go over all nuts and screws yourself.

who is to drive. A start should of course be made with an ordinary tricycle, say, of between 2 and 3 h.p.; and when this is thoroughly understood, advances may be made in stages. Say the rider commences with a 2¼ h.p. tricycle. When mastered, he may venture on a 3½ h.p. machine, and then take to a 6 h.p., and so on, till the high-powered motor is reached, by which time the driver will have gained in knowledge and, what is of equal importance, in confidence and



3.—Pour the petrol into the tank yourself.

MINERVA MOTORS.

Mr. A.....a Cycle Agent in a large Town in the Midlands, called a few days ago at my office. We had the following conversation:—

Mr. A.—"Well, Mr. Citroen, the announcement of the "1903 improvements in the Minerva Motor has "caused quite a stir."

I.—"So it seems. Especially the statement that others "who tried something on these lines in 1897 had "to give it up."

Mr. A.—"It would not be the first time that the Minerva "succeeded where others failed, and I feel sure the "manufacturers of the Minerva could well afford to "leave ***well*** alone, unless they were certain they "had something ***better.***"

I.—"Quite so, and be sure they will never be deterred "from trying what they can accomplish, because "somebody's grandfather failed to do it."

Mr. A.—"I know what you are referring to, but don't "complain: you could not be advertised to better "advantage"

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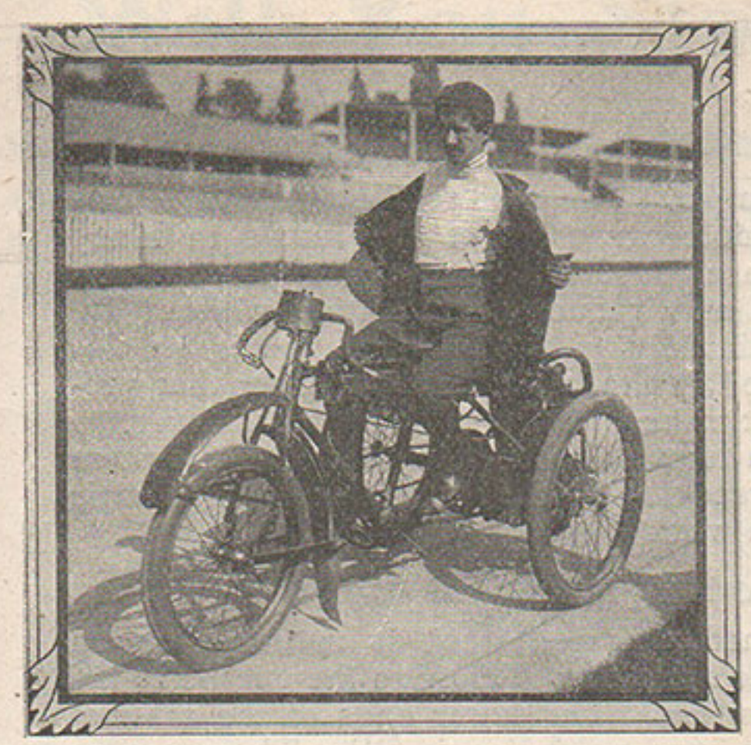


4.—You take off your coat and appear as a cycling champion.

skill. The same remarks apply equally to speed; and before high speeds can be ventured upon, the rider must learn to control his tricycle or bicycle at medium speeds. In short, it is a case of learning to walk before you can run.

Two things should be carefully looked to before starting a speed ride—the nuts and the tyres. These I always supervise myself. All details should be studied, and all the accessories needed in the course of the ride should be provided, for it must be remembered that the slightest omission in this respect may be fatal to success in a race or a time trial. Therefore personally overlook the machine, and tighten up all nuts, and don't mount the machine until you are satisfied that the tyres are quite as they should be. Put the petrol in the tank yourself. I always make a point of doing this work myself, and also the lubricating oil for the engine.

5.—Two friends are not too many for starting the engine on my racing tricycle.

Adopt a suitable costume, bearing in mind that at the speed you will attain it is necessary to have the body covered and well protected by woollen garments next the skin.

BEFORE STARTING MAKE SURE

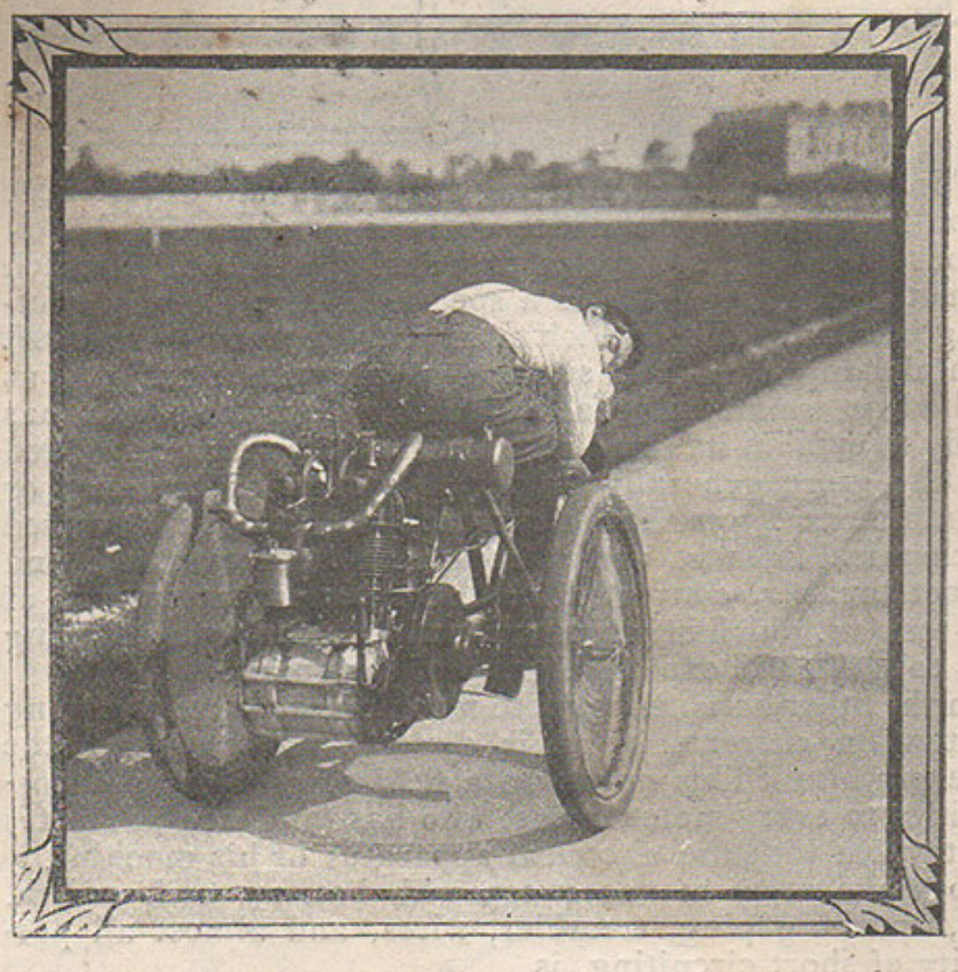
that the carburetter is in good working condition, and the valves are fitting correctly. Then get two good friends to give you a vigorous push off till your engine gets going. I always require two strong fellows to push off my 8 h.p. tricycle, as shown in the photograph.

When riding, turn round as seldom as possible. If you have steered past another machine, and have to look round to see how your man is going, only turn round on one arm, and leave the position of the body undisturbed. You will see what I mean by this by glancing at the photograph, in which I am depicted in the act of looking behind me.

It is a difficult matter to say what a rider should do

IN THE EVENT OF AN ACCIDENT

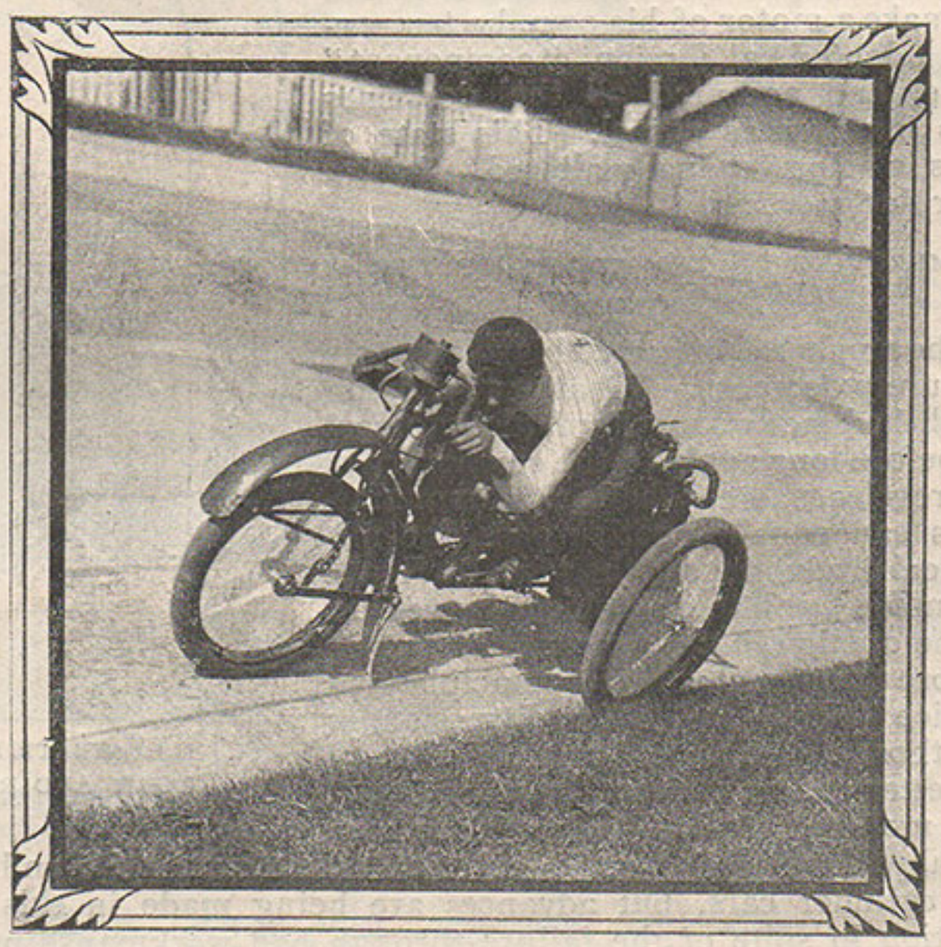
being imminent and unavoidable. The first thing, of course, is to switch off the power, and then, if possible, the best thing would probably be to steer into the centre of the track, or, as it is called in England, the enclosure. Of course, so much depends on the nature of the impending accident, and it is



6.—If you have to look behind do it like this.

really a matter for the rider's judgment—and he must be quick indeed to decide which will be his best course.

Round the bends it will be necessary for the rider to be quite acrobatic at times. The photograph on this page shows the position I adopt at high speed on a well banked curve. All the advice here given is entirely the outcome of my own personal experiences with high-powered racing motorcycles. I give it with the desire of encouraging others to follow in the same line; but I will be candid, and tell you that it is a dangerous game. Yet at the same time one can guard oneself against many terrible accidents by careful and, above all, personal attention to the business. Trust nobody to do anything for you. It is your own life you stand to lose, and therefore you should look after the minutest detail in person. I may say that, when I have succeeded in beating all racing records on my new 32 h.p. motor-tricycle with direct drive, I intend to definitely give my attention to car driving, which is undoubtedly the most interesting and fascinating from all points of view.



7.—Track motor-racing is not always easy. On the banking it is necessary to be quite acrobatic at times.

B

SOME ASPECTS OF MAGNETO IGNITION.

By E. M. F.

[The writer of the following article is an experienced motor cyclist, who has ridden some thousands of miles on various types of motorcycles, but chiefly on those in which magneto electric ignition is a special feature. Some interesting points are raised which merit consideration.—EDITOR].

In dealing with the subject of magneto ignition, as applied to small internal combustion engines, one has chiefly to explain its principles and advantages as compared with the more generally employed system of batteries or accumulators. From these a current of low tension is evolved by chemical means, and, through an induction coil and contact breaker, converted into an intermittent current of high tension, which is in turn utilised by means of a sparking plug to ignite the explosive gases of the engine.

On the other hand, a magneto machine produces a varying low tension current, which is directly used to serve the same purpose. This opens up a field of considerable possibilities to every motor cyclist who has (and who has not?) had trouble with the electrical apparatus of his machine.

To make away at one sweep with battery, coil, switch, plug, sparking plug, trembler, wires, and almost all possibility of short circuiting, is

A BOLD MOVE,

which, however, not only can be, but is in several instances done by the adoption of well-designed magneto ignition, and such will, I believe, in the future be more generally used. Questions may arise as to the reasons that an ignition with such desirable features is not more popular at the present time. One reason for this is not far to seek, for, with but few exceptions, the average motor-bicycle has been a British-built bicycle with a French or Belgian motor attached. Such are designed to work with batteries which are supplied with the "set," and, therefore, batteries must be used. Some two years ago the commercially-minded British cycle manufacturer saw a healthy-looking infant spring up in the form of a motorcycle "boom," which reminded him of his younger (and may be happier) days, when the cycle boom of '96 and '97 was in full force. Seeing in the new "boom" some traces of likeness to the old, and not having, in most instances the time, disposition, or experience wherewith to design and make a motor of his own, he temporarily adopted a foreign "component" engine, and accepted all the doctrines of its inventor as gospel. This state of things is being gradually altered. British motor-designers are

IMPROVING ON THE WARES OF THE FOREIGNER,

and the number of imported bicycle motors will surely decrease. What is already an established fact with regard to motorcars will before long apply to the smaller fry of motorcycles, namely, that British manufacturers can equal, if not surpass, the mechanical productions of their foreign rivals.

I am led back to my subject by venturing the opinion that magneto ignition will be more prominent when its principles and practice (which are, in reality, simpler than those of the battery and coil system) are better understood by the designers of small motors. It is not within my province to deal with its adaptation to larger vehicles, such as two and four cylinder cars, but advances are being made in this direction in spite of the failure through bad workmanship of some earlier attempts. The motorcycle riders of to-day are probably the motorcar users of the future in many instances, and they are not slow to study and appreciate any improvement which may reduce complication without appreciable loss of efficiency. Magneto ignition is on this score being "weighed in the balance," and, after that process is over, I do not think that it will be found wanting.

I will now pass on to explain the simplicity of the system by referring my readers to the adjoining diagramatic sketches. To begin with

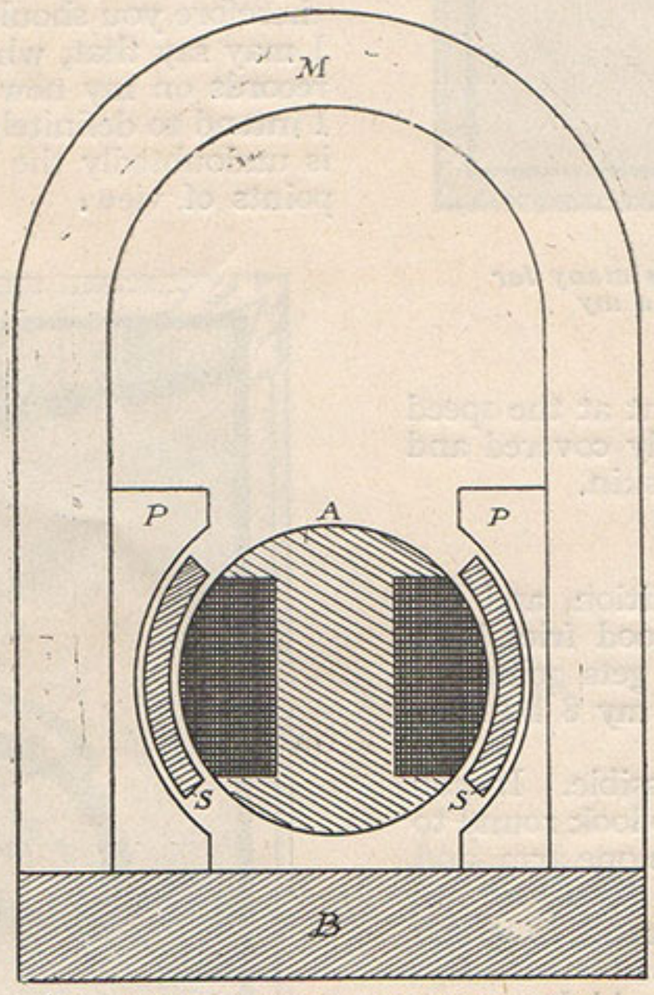
A SUBSTANTIAL HORSESHOE MAGNET,

M, made of hardened, selected steel, is mounted on an aluminium bed, Plate B, and fixed close to the engine in the most convenient position. The lower ends of the magnet support, or embrace, two pole pieces, PP. These are so placed to concentrate magnetism, or "lines of force," and are also shaped to receive a rocking shield, SS, and armature A with the greatest possible economy of space for both mechanical and electrical reasons.

The armature A is of H section, carefully wound round the middle with a large number of turns of fine insulated copper wire, one end of which is attached to the bed, B, and the other end being conducted more or less directly to the ignition fitting of the engine.

The bed, B, is an electrical conductor, but, being made of aluminium, is also anti-magnetic, thereby allowing a stronger magnetic "field" to exist immediately between the poles, PP, through not conducting any appreciable quantity of magnetism.

The principle in a nutshell is that, given a magnetic "field," and the means of disturbing or deflecting the natural tendency of that "field," a remarkably strong electric current can be simultaneously induced to flow along a wire, or a series of wires, if such remain in the "field" during the process of disturbance. In fact, the same result is obtained as if the armature containing the wires were rotated in the "field."



(1.) ILLUSTRATION OF MAGNET, ARMATURE AND ROCKING SHIELD.

In one of the best known forms of magneto ignition this disturbance is obtained by mechanically oscillating the shield, SS, thereby causing the strongest path taken by the "lines of force," which constitute the "field" to be repeatedly altered according to the motion of the shield. The armature winding is thus alternatively exposed to, and protected from, the full force of magnetism which rushes between the poles, PP, taking the route of highest conductivity however such may be placed.

The magnet, M, is, of course, very heavily saturated with magnetism, and will, even with considerable use, retain effective force for several years, after which it can be re-magnetised and be as good as ever.

Given then a practically permanent magnet and the mechanical means of distributing its "field," a current, which to all intents and purposes is continuous and of good pressure, can be generated within the armature fixed for that purpose within the field. It then remains to conduct that current to a point in the combustion chamber of the engine and to adopt some mechanical means of interrupting its flow at that point, thereby causing a spark to take place at the correct moment for ignition. In the Simms-Bosch engine an ingenious device is employed, whereby the sparking can be advanced and retarded similar to the method

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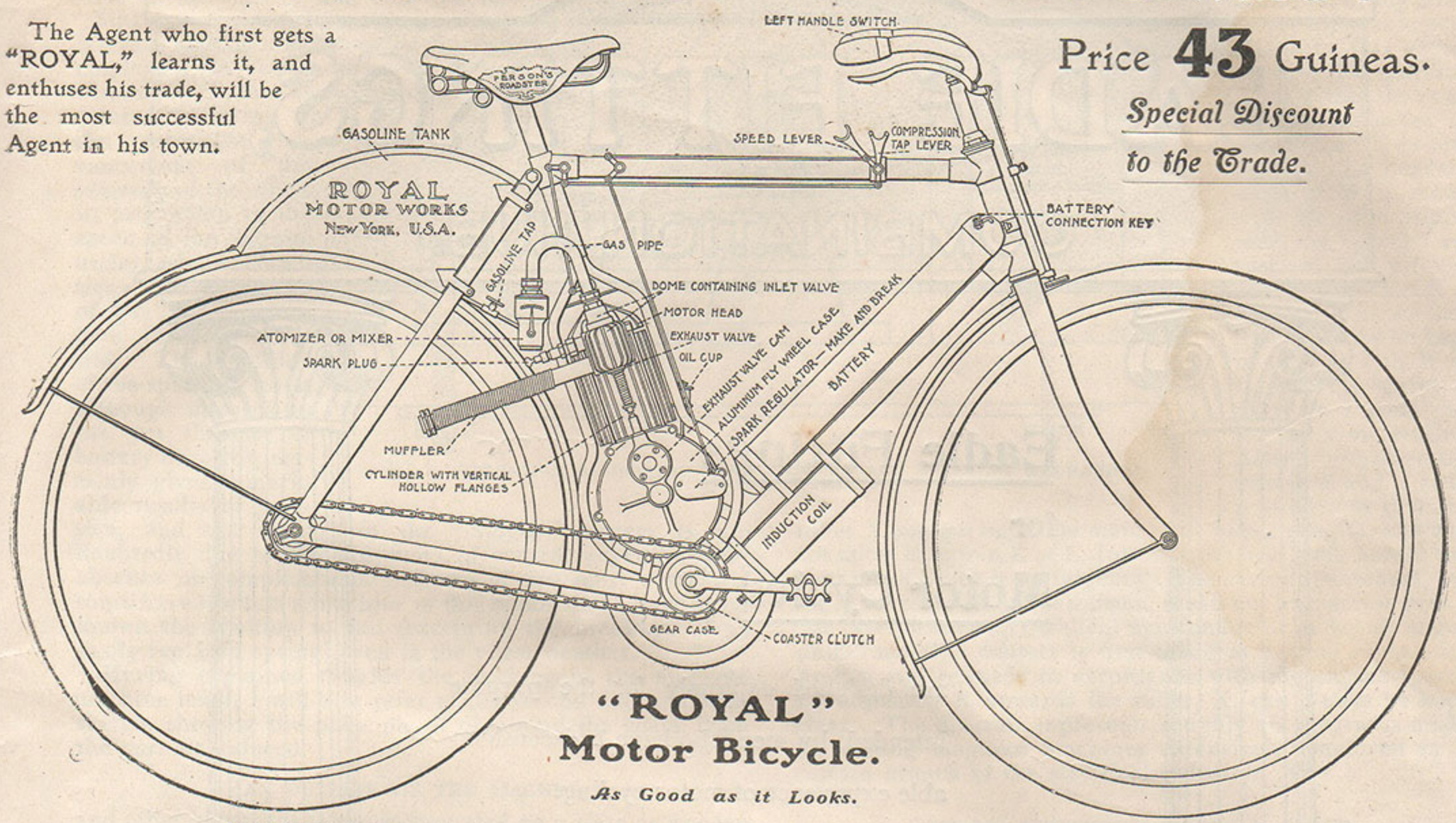

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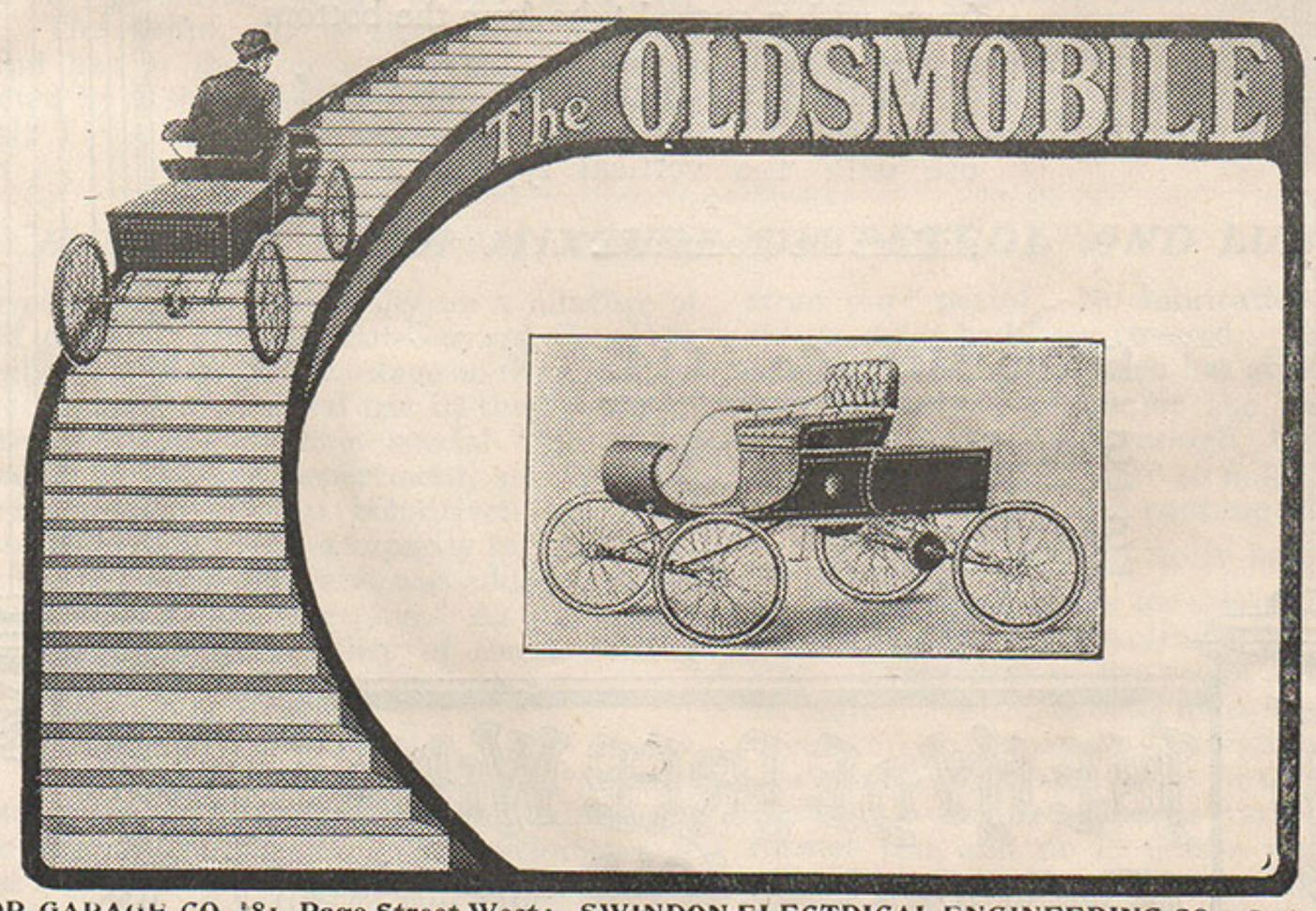

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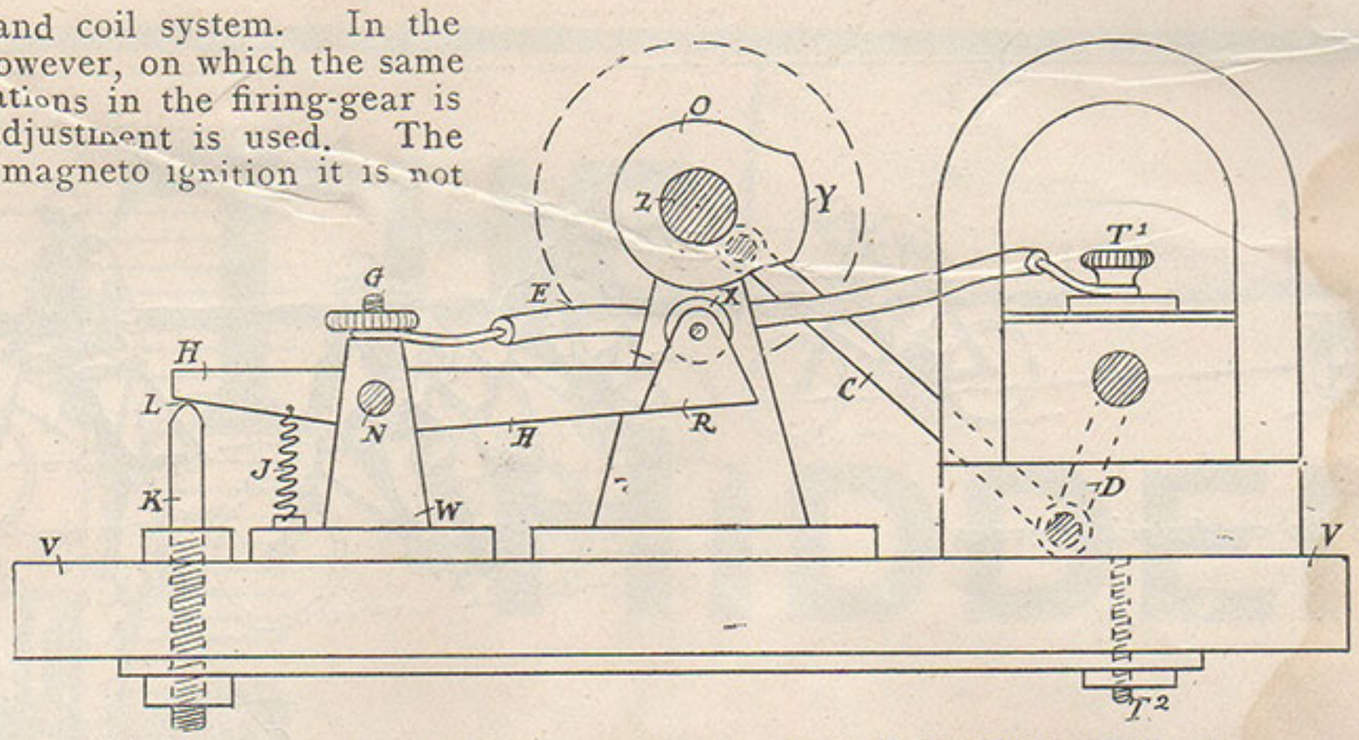
used in the battery and coil system. In the "Singer" machine, however, on which the same ignition with modifications in the firing-gear is employed, no such adjustment is used. The contention is that in magneto ignition it is not necessary, owing to the automatic advancement of the *intensity* of the spark in proportion to the speed of the engine, under which conditions the throttling of gas and mixture give complete control. The abolition of the sparking lever, although opposed to the pet theories of battery devotees, certainly gives remarkable results in practice, and the success of the "Singer" system is undoubtedly due to the simplicity of control engendered by absence of complications. Some of my most successful tours have been on a machine of this make, and I have never known the ignition to fail (excepting the breakage of an easily replaced spring) even in the vilest weather.

Having explained roughly the working of the magneto machine itself, I will now refer to the second diagrammatic sketch, showing the principle of obtaining the spark from the current induced.



(2) ILLUSTRATION OF DRIVING GEAR AND CONTACT BREAKING MECHANISM.

AN OUTLINE OF THE MAGNET

and other apparatus is shown mounted on a slate or wooden base, VV. The shaft, Z, which is equivalent to the half-speed shaft of the motor, is held by suitable bearings, and revolved pretty rapidly by any convenient means. At one end it has a short crank and a rod, C, connecting with a lever, D, attached to the oscillating shield of the magneto machine. At the other end it has a cam, O, with its short projection, Y, set to engage a roller, X, held by a bracket, R. This bracket is connected to a beam, H, in such a manner that it is insulated from it by a strong fibrous material. The beam, H, is supported at N by a bracket, W, and has at the top a terminal, G, which is directly connected by a short insulated wire, E, with the magneto terminal, T. A spring, J, keeps the end of the beam, H, firmly down on an adjustable peg, K, at L, this representing the sparking point within the combustion chamber of the motor. K is connected from beneath by a strip of metal with T2, and represents the "earth" return of the circuit. The reason that K is adjustable is so that it may always be kept in contact with H at L, and the spring J must be a good one for the same reason. After considerable wear of K and H at L, it is obvious that the roller X will get on to the main body of the cam, O, and will not allow H to join K at L. Intermittent firing will herald the approach of such a contingency. The current generated, being, as explained, of low tension, it will not leap across even a thin layer of such an excellent non-conductor as dry air or gas unless metallic contact is first made at L, and repeatedly broken and re-made in accordance with the engine speed. By adjusting K upwards the roller, X, can always be kept clear. The diagram represents roughly an apparatus made for testing magneto machines extensively employed in a certain branch of the electrical industry. The

GENERAL EFFICIENCY OF THE MAGNETO

is, however, indisputable, with which statement I feel sure my fellow-contributor "Magneto" will agree. It has been used for years in many electrical appliances, and its more general adaptation to the small motors of to-day is only a question of mechanical detail presenting difficulties which are by no means insurmountable. There are indeed already several satisfactory fittings made with durable insulation and easily accessible sparking points not readily fouled with the products of combustion. Small wearing parts can be easily and cheaply replaced, whilst with good fitting compression can be well kept, and regular sparking obtained at very slow as well as at very high speeds.

RUNNING A MOTOR ON A MIXTURE OF PETROL AND LUBRICATING OIL.

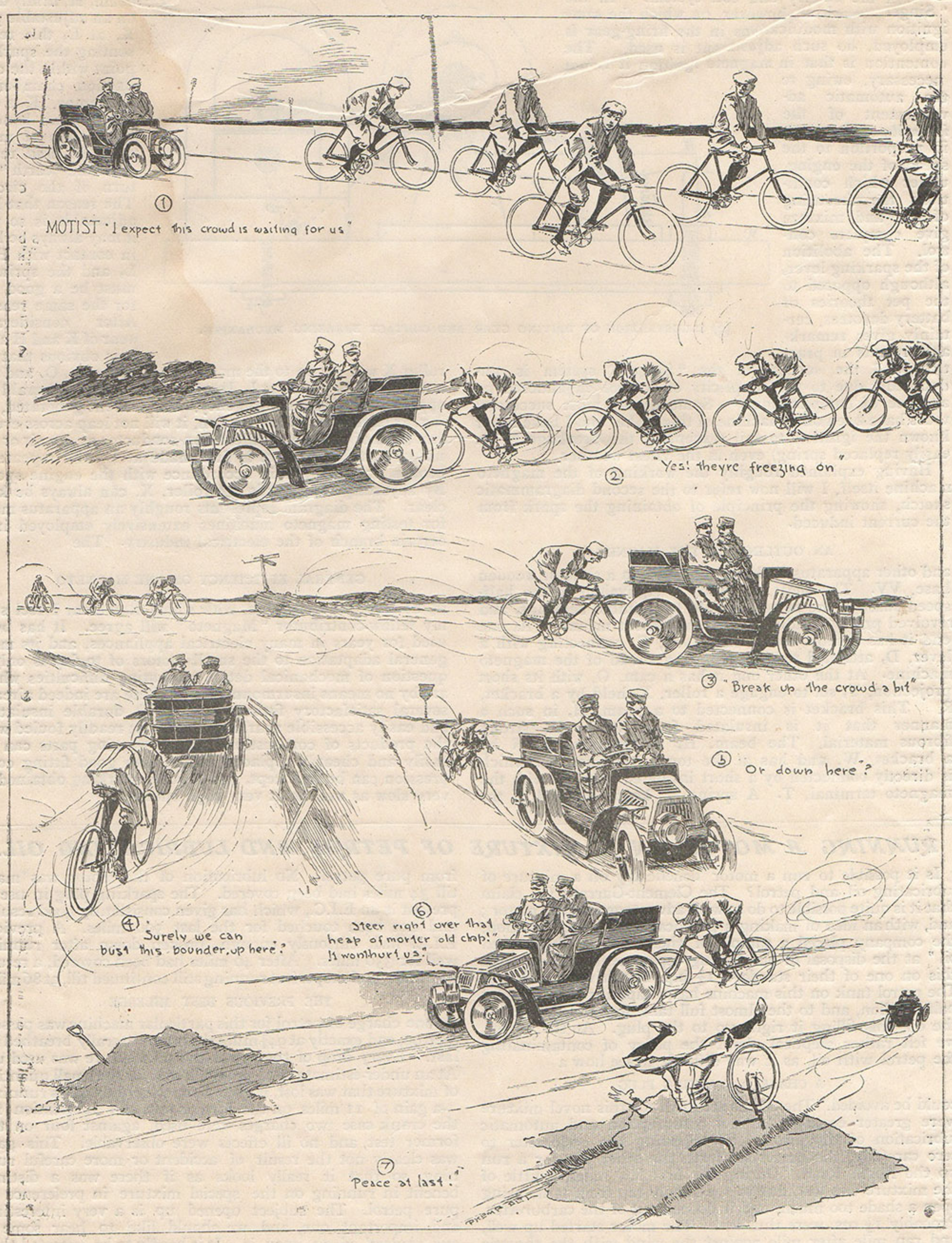
Is it possible to run a motor beneficially on a mixture of lubricating oil and petrol? The Clement-Garrard Co. claim that it is quite possible to do so with advantage on their motor; and, with an idea of making a practical test in this direction, the company placed a sample of their special "high-speed oil" at the disposal of our testing department, and we tried this on one of their standard 1¼ h.p. belt-driven machines. The petrol tank on this machine has a capacity of just under half a gallon, and to the almost full tank was added 5 ozs. of the oil, this filling it right up to the plug. At the outset, we felt rather sceptical about the policy of contaminating the petrol with oil, as it was difficult to see how a

A CHARRED SPARKING PLUG

could be avoided. The claims set forth for this novel mixture were greater economy in fuel consumption and automatic lubrication of the piston. So adjusting the cyclometer to zero carefully, the writer set forth the other day for a run up the North Road. During the first few miles, a little of the mixture was lost, due to the supply tap from tank being open a shade too much, and it flooded out of the carburetter. Probably 1½ ozs. were thus lost. The motor started up well, and ran mile after mile against the wind with the throttle only a quarter open. No signs of misfiring were apparent, and in fact it was hard to observe any difference in running from pure petrol. No lubrication of the motor was made till 34 miles had been covered. The sparking plug in use at present is an E.I.C., which has given consistently good results, and not been touched for the last 500 miles. A previous E.I.C. had, curiously enough, broken down after running well for 350 miles. After 40 miles had been covered, a return was made, and the perfect running still continued till, at 86 miles,

THE PREVIOUS BEST MILEAGE

on one charge of petrol for this particular machine was passed, then 90, and exactly at 94¾ miles the motor literally breathed its last. Every drop of the petrol and oil mixture was used up. At an under-estimate of 2¼ miles allowed for the small quantity of mixture that was lost, it gives a capacity of 97 miles running—a gain of 11 miles on the former test. Of lubrication for the crank case two charges were used, against four on the former test, and no ill effects were observable. This gain was clearly not the result of accident or more careful running, so that it really looks as if there was a distinct benefit in running on the special mixture in preference to pure petrol. The subject opened up is a very interesting and important one, and we should like to hear some of our readers' views upon it. It is hardly to be expected that the same results will be obtained with a surface as with a spray carburetter.



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MOTOR-BICYCLE ACCIDENTS.

How They are Caused, and the Way to Avoid Them.—*By "Magneto."*

The well worn proverb, "Experience is the only school for fools to learn in," came vividly before my memory, as on a recent Sunday morning I painfully limped along the road with a smashed machine and a badly damaged countenance, the result of a collision with that veritable "bete noir" of the bicyclist or motorcyclist, viz., the individual who jumps off a tram with a total disregard as to whether or not any vehicle is coming on behind. This painful experience—one which I devoutly hope will never occur again—set me thinking that I could not do better than take up the pen and give my fellow motorists the benefits of my past experiences on bicycle and motor-bicycle, and warn them of the numerous pitfalls and traps that lie in their path when riding along traffic-ridden roads. In an experience going back to the days of the solid-tyred safety—a matter of 14 years—I can only recall one previous accident, and this was in the winter of '92, when on a dark night

I CANNONED SMARTLY INTO THE ANATOMY OF A PONDEROUS GENTLEMAN,

who had evidently been to his club, mistook the broad highway for the footpath, and had no ear for warning bells. The usual interchange of courtesies followed, after which I shouldered my light Raleigh, and made for the nearest station—a wiser, if a sadder, man. My recent adventure was not a matter of a fall with a 25 lb. machine, but with a 75 lb. motor-bicycle, and I shudder to think of the consequences if I had been on a 180 pounder. Briefly, the facts are these: Sunday, November 2nd, being a delightful day—as November days go—I had determined to join the motor cycling club in a run to Aylesbury, starting from the Marble Arch at 10.30. Unable, however, to reach the rendezvous at the time appointed, I decided to make for Aylesbury alone *via* Ealing, Uxbridge, and Amersham, and meet the other members in time for lunch at Aylesbury. Slipping across Ealing Common, I was soon on the Oxford Road, and travelling well till, on reaching the arch near Southall, where the Great Western Railway crosses the road, an electric tram stopped sharp at a point where the metals come dangerously near the kerb. Here I came to grief, because just at the psychological instant when I reached the tram, and thought I could just steer through with plenty of bell ringing,

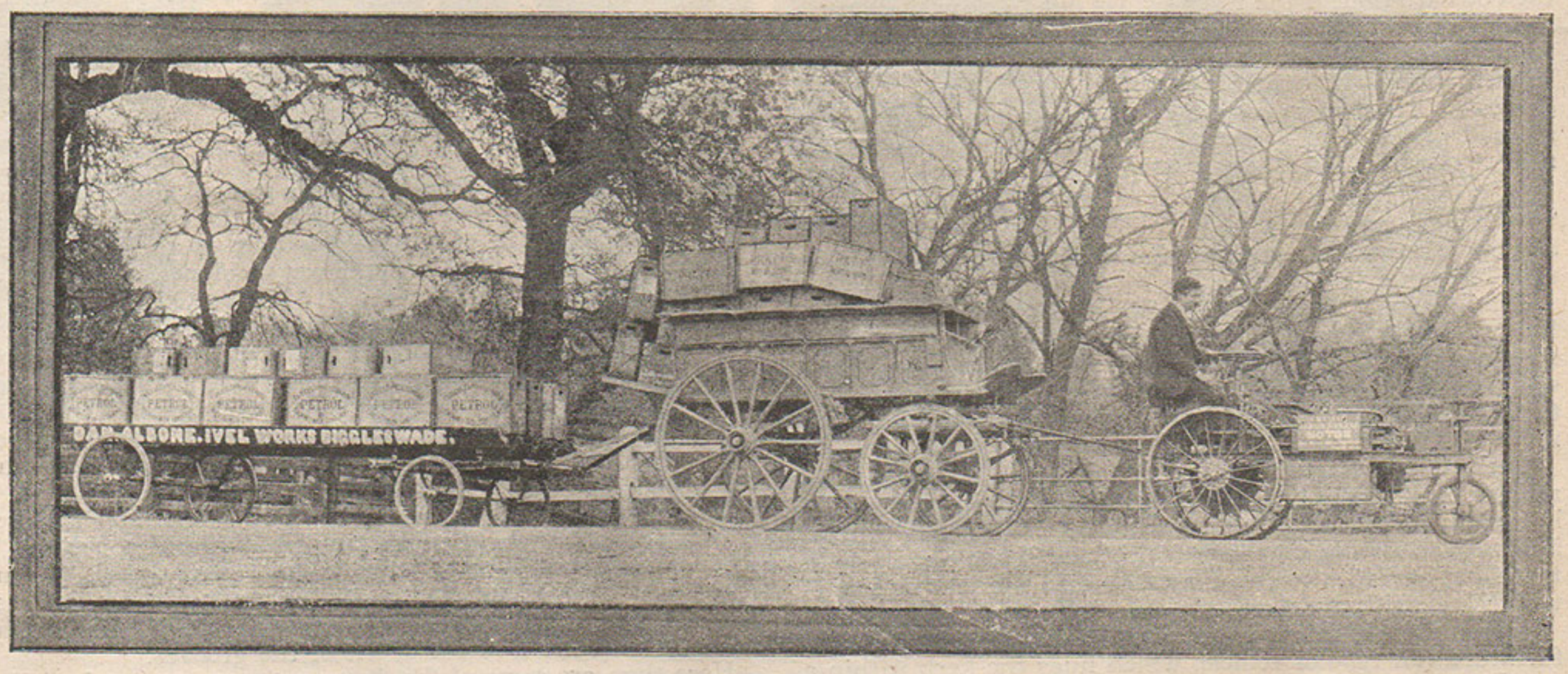
THE USUAL CARELESS PASSENGER STEPPED OFF BACKWARDS RIGHT IN MY PATH.

I might have been going seven miles an hour, yet the impact was violent enough to fling me four yards along the stony pavement, and I came with a rare bang against one of the trolley wire supports. The fall stunned me for a few minutes; but, much cut and knocked about, I pulled myself together, and had a look at the machine. Bad luck!—the back wheel wrecked beyond repair, and the tank bashed in; so, getting the loan of a trap from a neighbouring farm, I made tracks home. Here, then, was a case of sheer bad luck. In nine times out of ten, one can clear the car before the careless passenger dismounts; but here comes the awkward point: it is impossible to gauge, as a rule, whether the passenger is going to the right or left. So in future, the rule with me will be—either go dead slow, or dismount till the individual makes up his mind. If other riders are behind, give warning that you are going to slow up or stop by putting out the left arm, or a collision into your rear is not improbable.

THE NEXT TIP IS THIS: NEVER ATTEMPT TO PASS ON THE RIGHT OF AN ELECTRIC TRAM

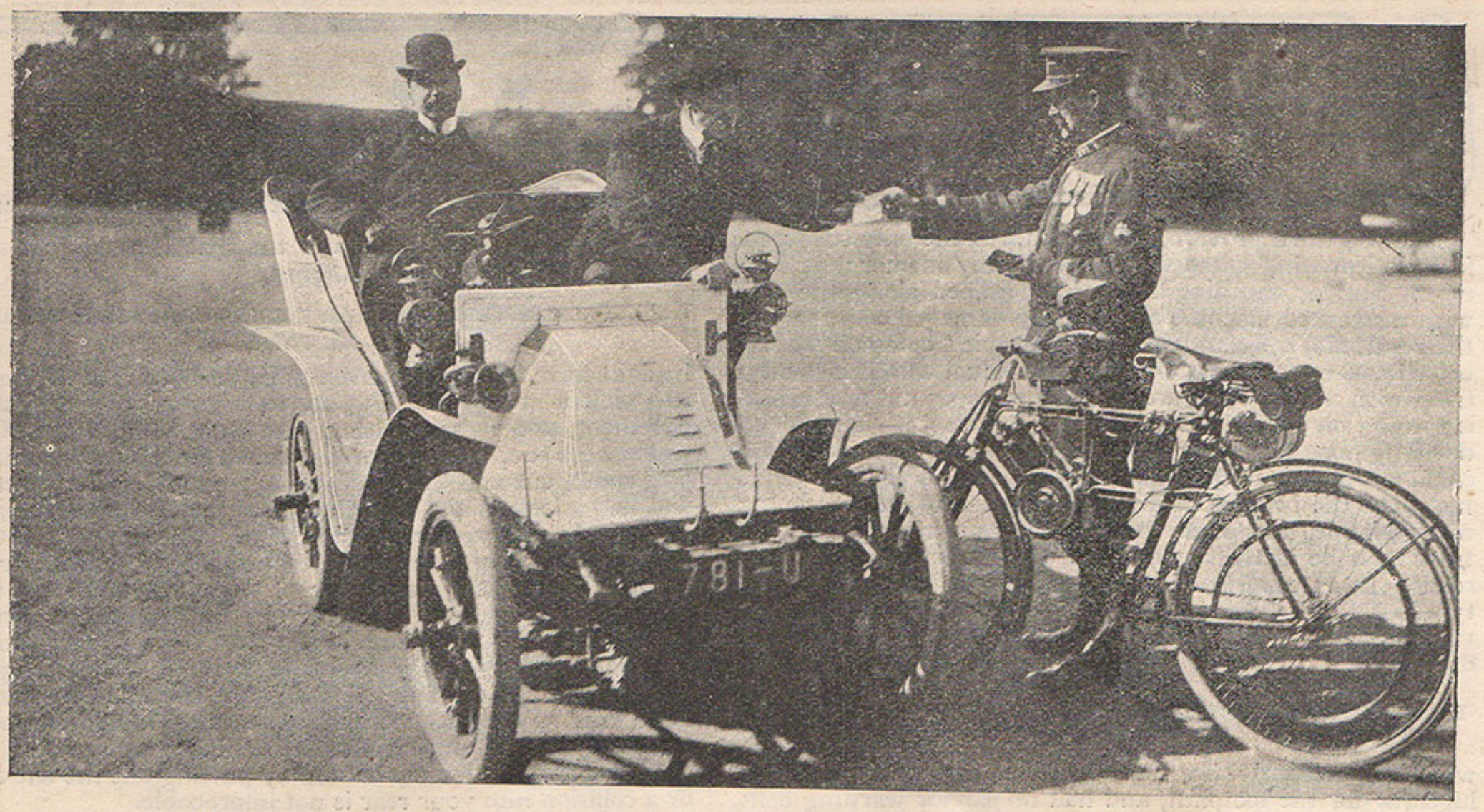
without being absolutely certain that another car is not approaching on the other line. The truth of this simple fact was vividly brought out in the case of the sad motor-bicycle fatality at Birmingham recently, and the narrow squeak a rider experienced at Nottingham some time ago when, on attempting to pass on the right of a car with a trailer, he failed to notice an approaching car, and got wedged in between the two. The speed of an electric car is most deceptive, owing to its gliding movement. The motto for both cyclist and motorcyclist should always be—give these veritable Juggernauts as wide a berth as possible. It makes one tremble to watch the novice pass a fast moving car on a greasy road, and get between the metals. A side-slip, and a fatal accident may be the consequence.

Now, with respect to riding in thoroughfares in which



A HINT TO THE RAILWAY COMPANIES.

This photo illustrates the method of conveying petrol from London to Biggleswade adopted by Mr. Dan Albone. C8



The Motor Cycling Policeman at work in France.—Taking the name and address of an erring automobilist.

heavy traffic abounds, like the streets of London, the rule is to keep well over to the left, and have your eyes wide open. Keep a sharp

LOOK-OUT FOR THE MAN WHO HAS A LIKING FOR SUDDENLY STEPPING OFF THE FOOTPATH,

and planting himself in front of you. This type of street danger can generally be spotted beforehand by his air of total self-absorption, and the curious way he sidles up to the kerb. A kind of instinct teaches the old hand at cycling that such a man is near by, and one gives his bell a preliminary ring to warn him. Then we have the cab-driving fiend, who never looks behind him on principle, and proceeds to swing his cab round in the road. This dangerous and senseless habit is very prevalent, and in the case of a motor-bicyclist coming along, the chances of a smash are great. Cabby generally gauges his radius to a foot or so to clear the down traffic, and the odds are that, if the rider swings out to clear the horse's head, he may crash into a 'bus coming along—unless he performs the difficult feat once recorded of a cyclist who, finding himself in a tight corner like this, rode under the horse's stomach. Here again the remedy is to run no risks. Either go dead slow till you can get behind the cab on your left hand side, or clap on the brakes and stop.

CAB DRIVERS, AS A RULE, ARE QUITE DEAF TO MOTORCYCLE HORNS

and bells, but an exhaust box explosion generally wakes them up a bit.

The danger of cross-road traffic is fairly well recognised. Never cut past a cross road at any speed unless you can clearly see the position of approaching traffic. It is a common trick of some drivers, when turning into a street, at right angles, to take the shortest cut, and an approaching cyclist runs the risk of getting blocked between the vehicle and the left kerb.

The position of obstructions and excavations in the road require most carefully judging, especially at night, if on the left side. Remember, traffic will have to swing out to clear it, leaving no room on the outside; and if one's machine is travelling at any speed, it may dash into the rear or side of the vehicle, with disastrous results.

Another fruitful cause of accident is the slow-moving furniture van type of vehicle, which hugs the kerb within a couple of feet, and lures the unwary rider to attempt to risk the passage, and, as sure as fate, closes in just when he is

half-way through. Here take no chances, but steer round on the outside. The nervous or novice class of cyclist requires a wide berth on the public highway to practise his gyrations and wobbles. A sharp blast from the motor horn not uncommonly

WILL LITERALLY BLOW HIM OFF HIS MOUNT;

and if you are close up, an exciting time is not unlikely.

Nervous lady riders with a great dread of motorcars often mistake the motorcyclist's horn for a car horn, and promptly dismount in the middle of the road. Out in the country the high road is generally recognised by the villagers as the legitimate playground for the children, who have recently hit on a new game, viz., throwing their caps at the belt of a motor-bicycle. A bad accident occurred on the Liverpool and Chester road through this recently; so that one must keep a sharp eye on the young rascals, and steer wide if there are signs of mischief.

When riding at night, one cannot be too cautious. Heavily laden farm produce carts, making slowly for town without rear lights, are perfect death traps. The driver generally goes

TO SLEEP, AND THE HORSE TAKES SOLE CHARGE.

One must have a first-class light on a motor-bicycle for night riding, sufficient to show up the rear of the cart in time for the rider to clear it. Dogs and poultry as cycle smashers are, of course, unequalled, and the ways and means of clearing them has already been discussed in "MOTOR CYCLING."

The side-slip season is now at hand, and the rider will do well to keep his machine on the crown of the road as much as possible, and keep the speed down and swing out wide when taking corners. To ride with half inflated tyres is courting disaster. Pump them up flint hard, and then the tyre will get a firm "bite" of the road, and not slide about on the mud.

Tram lines must be crossed at a sharp angle, and beware of striking a stretch of what might be termed "boulder" paving—that is, a type of large, round-topped stone. Then sometimes at a crossing the paving setts run in grooves parallel to the rider's direction of travel. Cross these at an angle to keep the tyre out of one of the grooves.

Here then are some of the dangers that one must be fully prepared for, and the proverb that "the wise man learns from the experience of others," should be kept in mind.

IN TRANSIT.

Some Experiences of a Cyclist in the Transition Stage.

Paraffin in the Cylinder. One of those "little things" that go towards an elimination of trouble is the application of paraffin to the cylinder after a ride. The idea seems to me to be this: Oil, so long as it is kept moving, will not set into a glutinous deposit, but it will do so if it be allowed to lie on a hot surface which gradually cools down until quite cold. The oil then dries like varnish and, as a consequence, the piston will stick fast. Now I must admit that, whether I have paraffined or not after a ride, the piston has never been found to be glued to the cylinder, but it would appear to be advisable to prevent such a mischance if possible. I have noticed drivers of cars injecting a few drops of paraffin into each cylinder at the end of a run, and then giving the starting handle a brisk turn or two so as to get the paraffin well distributed, and, as I can see no objection to it, I have regularly followed the practice. But it must be admitted that many people in the motor trade, with an abundance of experience, never use paraffin except when the engine is difficult to start. So far, I have not been able to find out their reason; they usually answer an enquiry by saying that they do not think it necessary. It certainly would be unwise to inject a lot of paraffin at a time, because of the probable creation of soot; but a few drops to liquefy any oil that might be above the piston can surely do no harm, whilst the engine is always free to start afterwards.

I had a letter from a reader the other day in which, *inter alia*, he mentioned that he regularly cleansed out his crank chamber with paraffin after every ride. Now I certainly think that this is a mistake. There is no need for it at all; it is very wasteful of oil, and the chances are that one of the bearings would seize, when the engine was next started up, before the new charge of oil could be properly distributed.

Is Frequent Cleaning Necessary? Harking back, I find that I have thoroughly cleansed the motor about once in a thousand miles, and the real reason on each occasion has been that I have wanted to test a new brand of oil. The cleansing is done with about three full charges of paraffin. The engine is worked rapidly through the pedals, and then the dirty fluid is drawn off. This operation is repeated once or twice until the paraffin runs out clean, and then a final sluice is given with petrol, the function of which is to eat up the paraffin and leave the interior clean and dry. After the petrol has been drained away, the ball valve is removed and the drain tap left open whilst the engine is again rapidly worked, in order to drive out all petrol vapour. Then a charge and a half of oil is given, and the engine again worked, in order to get the oil well distributed. The motor can then be left without any danger of the action of rust. I remember putting in a couple of charges of oil after one of these cleansings, because I argued that there was always a certain quantity of oil in the crank chamber when one added a fresh full charge, so one charge into an empty chamber would be insufficient. The engine started and travelled well; but after standing for an hour at my destination, the motor refused to start when I tried to get the mixture on the stand, and on looking at the inlet valve I found it glued to its seat with a varnish-like film. I had never had such a thing happen before, nor has it occurred since, so I assume that it was caused by the excess of oil which had worked above the piston. I should like to know whether other readers have tried paraffin in the engine after a ride, and what conclusions they have come to on the matter.

The Need for a Good Saddle There are two things which I am looking out for at the Shows, and up to the moment of writing I have not come across the ideal of either. I want a really good motorcycle saddle, and I want a compact, yet capacious, tool bag. All this year I have been unhappy on any saddle which I have taken from my own assortment, and nothing that has yet been shown me has induced me to exchange coin of the realm for it. I find the best of my bunch to be only good enough for a twenty miles ride; after that I pine for something else, and I feel certain that many others feel similarly to myself in this matter. Some riders seem to consider that something more in the nature of a seat with a back rest would be preferable to the saddle, but the back rest would unquestionably be fatal to a hurried dismount. The saddles at the Shows are being most critically scrutinised, and I find the attendants are beginning to wear a worried look whenever they see me coming towards them.

and for a Good Tool Bag. This is another very necessary article. At present I find that my own tool bag, although fairly large, only contains a few of the tools, spare parts, and repairing materials that I like to carry with me; consequently, a second wallet has to be carried, and a vacant place in the carburetter case is also utilised for the reception of some spare parts. And even now I find that there is no room for spare valves and springs, and I always have to be cautious about the way in which I open the first tool bag, because the voltmeter has a handy knack of falling out and smashing its glass. The tool bags which I have seen so far are exceedingly bulky, and in most cases the room in them is badly apportioned; but I really have not had time yet to do the round of the Shows in search of this really good tool bag.

Voltmeters and Testing Lamps. A voltmeter is a most useful little instrument, and as my own has been away for repair for about a fortnight, I have missed it greatly. The only objection to it is that the price, usually about 25s., is a bit stiff. The four-volt testing lamps are supposed to be equally useful, and they have the merit of only costing a couple of shillings complete. But although I have both, I find that the voltmeter is invariably used. It is said that the testing lamp is more useful in this way, that, whereas an accumulator may show a high voltage, it may really only contain a small quantity of current, and in fact be nearly run out. The voltmeter reading would therefore be misleading; but a testing lamp would have indicated the real condition of the battery, because there must be a substantial quantity of current at that voltage in order to render the lamp brilliant. The lack of brilliancy in the lamp would be an instant warning of the state of the battery. Voltmeters are invariably calibrated in one direction, so it is always best to attach the positive connection of the voltmeter, usually marked with the + sign, to the positive pole of the accumulator.

CYCLOMOT.

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OPINION.

The Shows.

The aspect of the two great cycle shows is changing. Whilst it would be quite inaccurate to even suggest that the bicycle is becoming supplanted by the motor-bicycle, it is an undoubted fact that, at both the Stanley and National Shows, the motor-bicycle is predominant. On almost every stand at least one motor-bicycle is shown: and some of the exhibits consist of nothing but motorcycles and their appurtenances. One only needs to carry one's thoughts back to the Show of about three years ago and to recall that single Minerva motor-bicycle shown, in a very half-hearted way, on the corner of a somewhat obscure stand. Its black carburetter case and glaring red lettering gave the machine a shoddy appearance, and many were fain to remark upon the undesirability of trusting their precious lives upon such a toy. But a couple of quick turns of the chronological kaleidoscope have entirely changed the view, and we can now realise to an extent (it may be to only a small extent) what a vast future there is before the motor-bicycle.

If at each show the strides made by the motorcycle during the past year are patent on every side, the greatest changes are, in all probability, to be seen at the Agricultural Hall. Last year the Minerva engine and the Minerva position largely ruled the roost, and many an honoured name in cycle history was attached to the productions of the enterprising Belgian firm. And, whilst that concern will have no reason to complain that the trade has by any means deserted it, yet, in nearly every instance in the case of the leading firms, new lines have been adopted, and there is evidence on every hand that individual thought has been expended upon the perfection of method and of detail. Consequently we see this year not only a great diversity of pattern, but we see that which is pleasing to the English eye, the stamp of British workmanship. And, where it is allied to the experience and genius of Continental motor engineers, the attained results are equally as good as if the whole product were from the English workshop.

The prospect of giving pleasure to somebody else has resulted in the popularity of the trailer, and now we can see the improvement upon the idea in the fore-carriage, which converts the bicycle into the tandem tricycle. Started (in this country) by Mr. Hooydonk, the idea has caught on in many quarters, and either it or the trailer will be taken up by all who have the room to store the passenger's seat.

The growth of the pastime of motorcycling and the development of the industry have been more rapid during the past eight or nine months than during any other period, and it must be something more than a mere coincidence that they have had during that period a paper specially devoted to their interests. If "MOTOR CYCLING" has had the great part in the work that we claim for it, we shall thereby be encouraged to press forward with our future policy with unabating vigour.

Next week will see the inauguration of this new policy, for in a greatly enlarged issue of "MOTOR CYCLING AND MOTORING," will appear a very fully illustrated summary of the movement towards the production of light, simple and cheap motorcars in this and other countries.

The Development of the Motor.

Our attention has been drawn to a paragraph in "The Draper," which, though it will not occasion alarm, or even solicitude in the breast of the motorist, may conceivably work mischief in the mind of the reader who forms his opinions largely and blindly on what he reads.

"The development of the motorcar," says the "Commercial Critic," "has been disappointing. Up to the present it has been a costly toy and a dangerous one, and its use for trade purposes has yet to be discovered. What the future may have in store it is impossible to say, but unless some more economical method of applying electrical or steam power becomes available, tradesmen will continue to prefer the horse and cart. For commercial purposes the cost will have to be reduced to less than one-fourth of the present prices."

That the development of the motorcar should not have come up to the expectations of "The Draper" will be perhaps a disquieting reflection to those who happen to know what those expectations were; whereas we, who are not favoured with this knowledge, may console ourselves with the thought that "The Draper's" standard of development was as unattainable as it was exalted. For we confess that although that development has not perhaps been quite all that it might have been—not all that, with a fair field and no favour, it would have been—still it has been a development, a natural development, creeping slowly and safely upward to the light of perfection through the clouds of prejudice, ignorance and bitter opposition.

That the motorcar has reached perfection no one will attempt to argue. It is as yet but a half-finished work, one of those works which, as the philosopher remarks, should not be criticised by children and fools; but it has at least advanced to such a pitch that grown-up folk of ordinary intelligence may recognise in its present status the promise of future greatness. We have no fear that criticism, backed by the ordinary arguments of the anti-automobilist, or (as in the case of the criticism under notice) backed by no arguments at all, will work any permanent injury to the sport or trade of automobilism, but we protest most emphatically against the retardation of progress, which may accrue to a young and important industry by the dissemination of such irresponsible stuff as this. The critic who condemns the motorcar as a "costly toy," and who "has not yet discovered its use for trade purposes," hardly merits serious notice: such an one would doubtless class in the same category of costly toys anything whose price could not be reduced to terms of elevenpence-three-farthings, or whose utility was not as immediately apparent as that of a yard of calico or a packet of pins: that "The Draper" has failed to discover the use of the motor in trade need not distress the automobile manufacturer. Such discoveries are only made on the far-side of the counter, by men whose vision ranges beyond the special "lines" of their shop; whose limbs, unfettered by the restrictions of red tape are free to take them out into the practical world, and whose mental apparatus is not overwhelmed by a multitudinous variety of haberdashery.

THE MOTOR EXHIBITS AT THE STANLEY SHOW.

The twenty-sixth Stanley Show is now open to the public, and it is crowded with interesting features. One of the most noteworthy points of interest is the prevalence of the motor-bicycle. On nearly every stand a motorcycle of some sort finds a place, and the advances that have been made in construction and in details since last year show how rapidly things are moving towards the development of this handy form of motor vehicle. The Motor Exhibits only are dealt with in the following pages, the Cycling side of the Show being fully treated by "Cycling."

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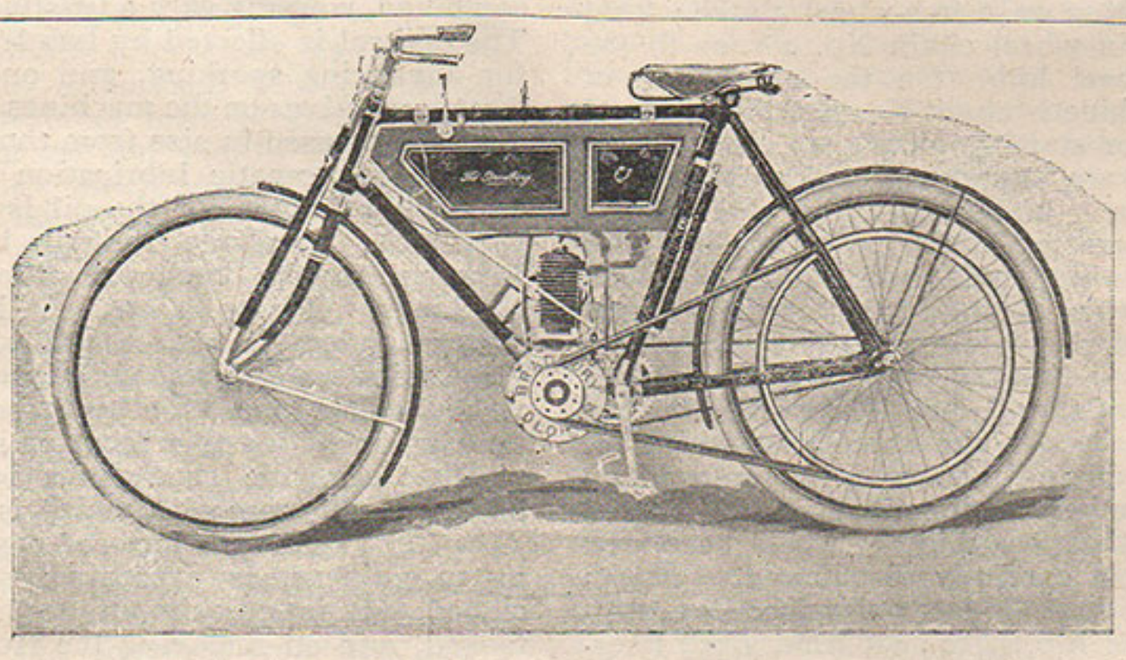
36. Peugeot Freres. The diagonal form of motor is adopted by this firm for their motorcycles, and is of 2 h.p., but with a very low weight of 77 lbs. only. It presents much the usual appearance, but differing in many respects in a large number of minor points, where the comfort of the rider has been studied. A special form of saddle reduces vibration. A 4½ h.p. quad. is shown for two passengers; water-cooled engine, with radiators fitted over the driving axles on each side of the back seat. Care has been taken to produce a very elegant form of quad. at a low price. There is also on view a single roller ½ inch pitch chain from ⅜ inch upwards, and the price for which works out cheaper than the lowest English-made.

105. Ariel Motor Co., Ltd., Bournbrook, Birmingham. The New Ariel motor-bicycle has a 2 h.p. engine, vertically bolted into the frame between the bottom bracket and front wheel. The steering head of the bicycle is strengthened by the addition of an outside tube from the front fork crown to the clip at top of head. The Ariel engine has the sparking plug screwed directly into the centre of the combustion chamber. A large tank is fitted in the frame, which holds two gallons of petrol, the bottom of the tank composing the well-known Ariel carburetter, holding a quart of spirit. Both inlet and exhaust pipes and valves are extra large, and the silencer is really a silencer, being a cylindrical box with three perforated partitions—this is very successful in muffling the exhaust. V pulleys and Lincona belt are used. Lubricating oil and batteries are carried in a small additional tank.

76. Bradbury and Co., Oldham, have in their new motor-bicycle struck out on somewhat new lines. The engine is placed vertically, and the case of the engine is a malleable casting in which the whole of the lugs and the crank bracket shell are included. Consequently the crank case of the engine can, without any fear of fracture, be used as part and parcel of the frame. The pulley side of the crank case is an aluminium plate. The cylinder dimensions are 66mm. bore by 76mm. stroke. The cylinder is cast in one piece with the head, and the silencer is placed close to the exhaust outlet. A surface carburetter is provided, but a spray is optional. A wipe contact is used with a Peto and Radford accumulator, and a trembler coil with Carpentier trembler. The positive terminal of the contact breaker has a spring behind it to keep it always up to its work. The connections for the wiring are exceedingly simple and effective, as they are effected by spring snaps. The first movement of the exhaust valve lifting lever cuts the current. Lubrication is provided by a pump placed conveniently at the fore part of the tank, where the oil reservoir is situated. The drive is through a Lincona belt, the gearing being about seven to one. The girder front forks are particularly good. On a 2½ h.p. machine shown there is provided an extra rear seat readily attached and detached, and carrying an extra tank, with compartments for both oil and petrol. The rear passenger places his feet on a pair of pedals provided for the purpose. A well-designed trailer is exhibited, and a motor-bicycle driven by a Clement engine with a chain drive is also shown.



The new Bradbury Motor-Bicycle.

145. Lycett's, Ltd., Birmingham. This firm is showing a good collection of tool bags and saddles. The Ark Motor bag shown, which, as its name implies, is somewhat in the form of a Noah's Ark, is provided with two sets of straps, so that it may be fitted to the back of the saddle or upon a carrier. It is fitted externally with a small pocket at each end, and internally with loops and pockets for tools, repair outfit, etc. It also has a strap to carry a cape on top. Another bag shown is divided into two parts, one being for an accumulator, and the other for tools. This latter is made to be carried by the top tube of a machine. A large square bag, which is intended to be carried behind the saddle, is fitted with an extra strap to attach it to the saddle frame.

11. Enfield Cycle Co. Ltd., Redditch, show two quads, one tricycle, and three distinct patterns of motor-bicycles. One of these has the Minerva engine and fittings, with mechanically-operated inlet valve, the speciality being the Enfield front forks. No. 2 has a 2 horse-power air-cooled engine, bolted vertically in the frame, in such a forward position that the pedal cranks miss the belt and contact breaker, so that bearing width in the engine has not been sacrificed, being 1¼ wide on each side. Drive is by a three-ply V leather belt, to pulley with extra wide flange, through which the spokes of the driving wheel are threaded. The third machine has a 2¼ h.p. water-cooled engine, bolted vertically in the frame; the timing shaft forms the driving shaft, but, instead of being at a two to one ratio, the reduction in speed is six to one, the necessary exhaust lifting and sparking cams being made in triplicate on the large tooth wheel; no other gears are used. The timing shaft isues from the crank case at the opposite side, and carries on its extremity a driving chain wheel containing a spring clutch, from which the drive is conveyed to the back hub by a special chain. The front compartment of the tank contains the cooling water, one and a half gallons being carried; 18ft. of ⅜in. aluminium piping, formed into a radiator, is coiled in the space between the tank and down tube. The weight complete, with petrol and water, is 140lbs., price 75 guineas, and speed 30 miles per hour. This, however, can be easily altered by changing the rear sprocket wheel. In quads, the well-known Enfield type is retained, fitted with either 3½ or 2¾ water-cooled De Dion engines, and Bozier two-speed gear, worked by lever at driver's side; the quads sell at about 120 guineas, according to power.

154. South British Trading Co., London, E.C. This firm is showing two new pattern powerful 20th Century lamps for motorcycles. They are both fitted with large parabolic reflectors, made of aluminium rolled on brass, and are very powerful light-givers. One of these lamps is for oil and the other for acetylene, the latter not being fitted with a spring back, but with a bracket, which clips direct on to the head of the machine. It is finished black (gun metal), and has a very taking appearance. This firm is also showing some useful wrenches, having curved handles, specially suitable for motorcycles.

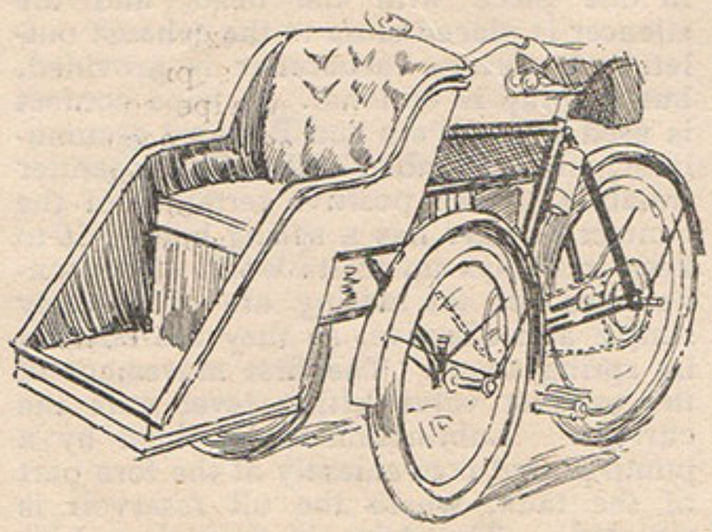
3. Carlton Motor Co., Cricklewood, N.W., have a full line of finished motors of 2 h.p., 2½ h.p., and 3 h.p., for bicycles, and 5 h.p. single cylindered and 10 h.p. double cylindered water-cooled motors for cars. Complete sets of castings are supplied, and these are of excellent finish and design. Connecting rods are steel forgings, and for bearings a very high grade of phosphor bronze is used, and a fine aluminium alloy for the crank cases. The well-known Carlton carburetter has undergone considerable improvement, with the addition of a positive measured petrol feed, and this ensures very economical working. The workmanship on this carburetter is of the best, and the makers will readily adapt them to any make of machine. The firm undertake all kinds of repairs to motors, and guarantee their work in all respects.

87. Osmonds, Ltd., Birmingham, show three specimens of Osmond motor-bicycles. In these the engine is clamped to the tube from head to bracket, the outside flywheel balances the weight of the engine, so that the total weight is central; drive is by twisted raw hide belt, running over a jockey pulley on main tube of frame. The claim of Osmonds, Limited, is, not that they have produced a racing motorcycle, but that their machine is still a bicycle, with the addition of an engine capable of propelling the machine and rider at the rate of 30 miles an hour; the weight of the complete machine is only 72lbs., so that the engine has not got a heavy load, and can put forth its best efforts with the least possible handicap. Although bicycle parts have been used throughout, strength has been increased where necessary, and replacements can be made with facility at bicycle prices—a good point. All Osmond motor-bicycles are fitted with the patent "Radilever" front rim brake, which can be swung from one side of the handlebar to the other, or placed in any position desired by the rider, without interfering with the adjustment of the brake. Belt pulleys are spoked into the back wheel rim; either back-pedalling hub brakes or hand-applied rim brakes are used, according to taste. Another pattern is shown having a chain drive and a two-speed gear, the engine being in the same position as on the previous machine, driving by chain to an additional bracket, placed a few inches in advance of the usual bottom bracket; this extra bracket carries the two-speed gear, which is on the sun and planet system, giving a reduction from high to low of 25 per cent. This enables the machine to mount any hill. The price of the belt-driven machine is £45, and the chain-driver, with two-speed gear, is £50.

158. The Birmingham Pneumatic Tyre Syndicate, Birmingham. The Woodstock motor tyre has bands of steel in sections in the edge of the tyre, and when in position these stand vertically in the rim. They are held in position and prevented from slipping in the bed by means of bolts, which engage with them through holes pierced in the rim.

69. Chambers Engineering Co., Birmingham, show three Royal Mail motor-bicycles. Number 1 has a Clement-Garrard engine driving through chains, a cross framed cycle being used. The combination is exceedingly good. The second pattern has a 2¾ h.p. engine in the Kelecom position, also driving through a chain. The third pattern has a 3½ h.p. engine in a vertical position, and with outside fly wheel; spray carburetter, large petrol case, and battery tank belt drive, whilst the control is by two levers on the handlebar. This machine is a fine piece of work. The price is £50.

125. Humber, Ltd., Beeston and Coventry. Seven motor-bicycles are shown, all of the Standard Humber chain-driven type. A resuscitated Olympia tandem is on view, with 3 h.p. engine, chain-driven, spring seat-pillar, and a luxuriously upholstered wicker seat between the front wheels, in which a passenger (lady preferred) can be carried. Wipe



The Humber Tandem.

contact is employed on all Humber motorcycles, the trembler being on the coil. The Humber chain-drive is perhaps too well-known to need further description, but we might just remind novices that the engine is hung on four pillars which replace the usual tube from head to bracket: the drive is taken by chain No. 1 from engine cog wheel to large chain wheel on bottom bracket spindle; inside this chain wheel is a smaller one, also fitted on the spindle, but running on a free-wheel clutch; from this chain wheel chain No. 2 runs to the back wheel hub. On the other side of the machine is chain No. 3, which is used solely for starting purposes; chains Nos. 3 and 2 are interchangeable as to length, so that any undue stretch in chain No. 2 is counteracted by swopping chains. Free engine is obtained, so that the engine can be idle when the machine is running downhill, and so get an additional chance of cooling. Ample brake and mudguard accommodation is provided on all Humber motorcycles. The same disposition of engine, chain-drive, etc., is employed on the Humber motor-tricycle, the engine being situated within the wheel base, and the weight carefully distributed. Prices are as follow:—Motor-bicycles, Coventry-made, 1¾ h.p., £50; 2¾ h.p., £55; Beeston-made, 1¾ h.p., £60; 2¾ h.p., £65. Tricycles, Coventry-made, £65; Beeston-made, 75 guineas.

67. Clarke, Cluley and Co., Coventry, show the Globe motor-bicycle, with a trailer attached. The engine of 2¼ h.p. is placed vertically in a loop frame: it has a spray carburetter, large tank, and battery and coil case, two brakes, and generally is on accepted lines. The framework of the trailing car is of ample strength.

192. Ross, Courtney and Co., Ltd., Upper Holloway, N. Like all enterprising cycle accessory people, this company are now catering for the wants of the motoring public, and in the Gallery have a display which includes lubricators, horns, lamps, valves, etc. Special productions of theirs are tyre inflators, and among the several specially adapted for motor work we noticed a foot pump fitted with pressure gauge registering up to 100 lbs. per square inch. It is provided with a large handle, while the "feet" are hinged, so that they fold up when not in use, and so occupy but a very small space.

242. Stanley Feast and Co., Ltd., London. The main feature to which attention is drawn at this stand is the "S. F." repair band for motor tyres. It consists of a thin pliable band, from 3½ to 4½ inches wide, and is intended for the quick repair of bursts, cuts, gashes, or weak places in outer covers. One end of the band is placed under the wired or beaded edge of the tyre, the other end slipping under the opposite edge. In the event of a very big gash, two bands, slightly overlapping, may be used. Tyre repair outfits, solution, and tyre cements are other specialities of this company, who are also introducing an enlarged model of their "S. F." tyre remover and spanner, adapted for use on motor-bicycles and cars.

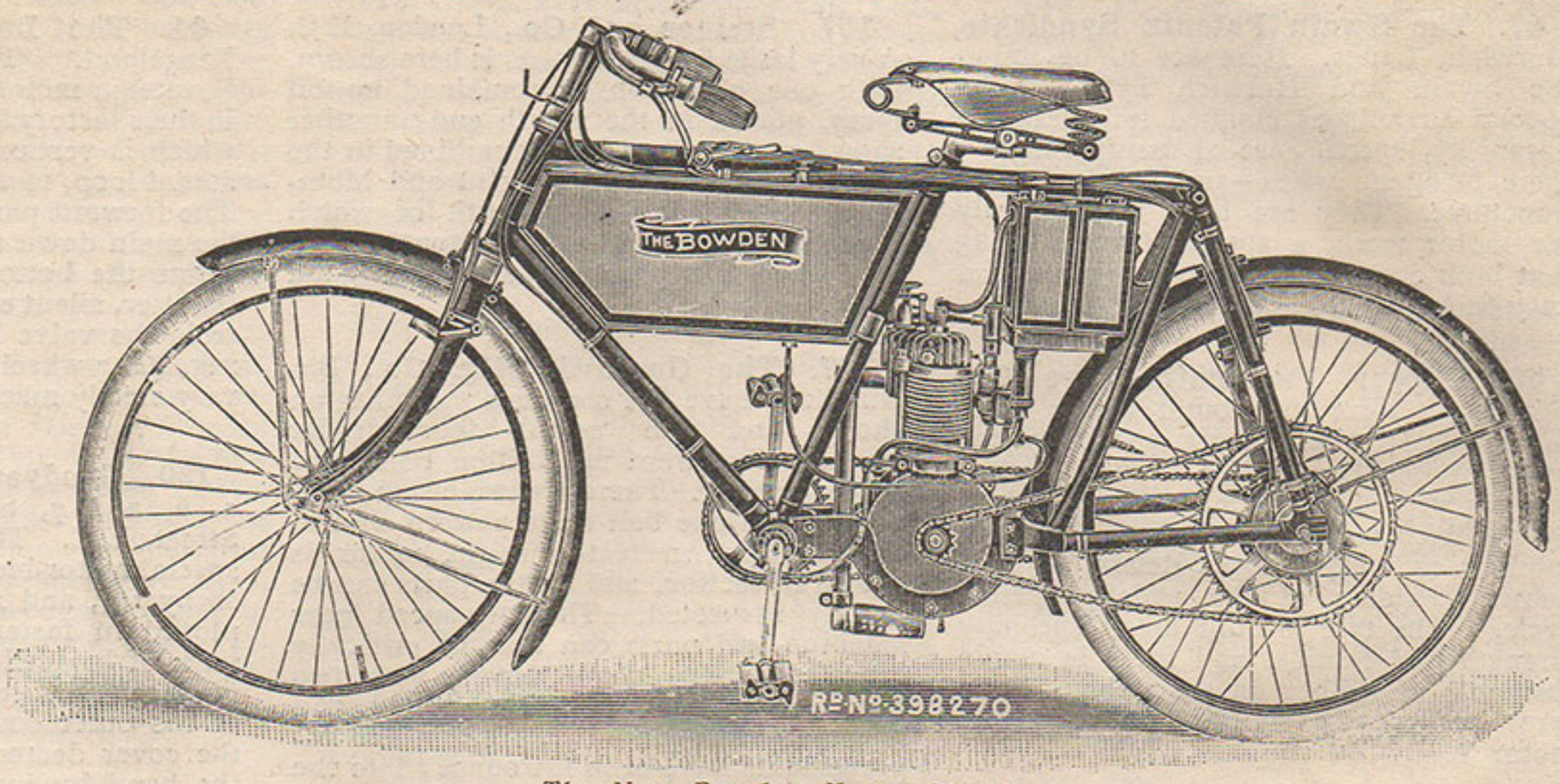
84. Ormonde Motor Co., London, W., have a fine show of motors of 2¼ and 2¾ horse-power, all of which are fitted with the Kelecom engines, in a vertical position, fastened in the rear section of the frame. The engine rests upon the chain stays, and is clamped to the seat pillar. Specially strengthened head and front forks are fitted. The silencer is carried underneath the bottom bracket. Machines are all fitted with the Ormonde special V section belt. The tank capacity is 7 quarts, capable of driving the machine 170 miles. A special indicator fitted on the outside of the tank is moved by a float in the petrol, and shows the exact quantity in the tank. The contact breaker and valve lifter are combined, working with a twisting handle. The control is effected by two levers, one for advancing sparking, and one for the throttle. Valves on the machines exhibited are all increased in size from those of last season. Automatic lubrication is fitted, and a light gauge for the oil is fitted on back tank. Ormonde front rim brake and Bowden on the back are fitted to all machines. Prices £45. A lady-back motor tandem is also to be seen here, fitted with a 2¾ Kelecom engine, and is worthy of an inspection by those who intend going in for this form of motoring, all the Ormonde specialities being embodied in this machine, which is listed at £60. The Ormonde fore-carriage, selling at 12 guineas, is exceedingly well designed. It is quickly attached and detached, and on removing the front wheel of the cycle and fixing up three clamps, a cycle is converted into a three-wheeled two-seated car.

24b. Maurice Knapp, Dunstable, Beds., shows a cup drawer, which is of an adjustable form, capable of extracting the tightest cup in the bottom bracket of a cycle or motor. Also a useful form of lapping tool for making joints, extremely useful to the frame builder. And also the M. and P. motor stand and luggage carrier, serving the dual purpose of a stand and home trainer, and also when turned up as a luggage carrier. When not in use it can be folded up. It also affords the facility of removal of the wheel, a thing to be desired, whenever the puncture fiend should be about. We consider a stand of this nature an absolute essential.

24. A. G. Quibell, London. A folding stand of a double triangular form, with strong base is shown here. The sides are hinged, and fold down into the base plate, thus enabling the whole to be easily stowed away. A pair of clips suitable for fixing to any form of chain stay are supplied and used when it is necessary to remove the wheel.

143. Bransom, Kent and Co., Ltd., London. At this stand are exhibited a number of parts particularly interesting to the trade. A motor-bicycle of parts made by this firm is on view fitted with a Minerva engine. A number of engines of various makes are on view, amongst which is a genuine De Dion motorcycle engine, which has only recently been put on the market. A very neat oblong metal case to carry a spare accumulator is shown, fitted with clips to attach it to the frame of the machine. A special motorcycle hub is shown, which should give great satisfaction. Several forms of new lubricators are on view, also spare petrol tanks, carburetters, and a small oval-topped funnel which can be readily carried in the tool-bag.

101. E. M. Bowden's Patent Syndicate, Ltd., Brook Street. E.C., show a frame with a special cradle to take any design of engine. The pedals and chain wheel are placed ahead of the engine, thus making a lengthy wheel-base. The machine is driven by chain and Bowden clutch, with the ordinary form of conical faces, but thrown in and out of gear by the Bowden wire, which permits a free engine at will. The claim that this firm has a design of machine adaptable to every form of engine operated entirely from the handlebars by the well-known Bowden system is clearly evidenced, as they show the frame fitted with various well-known makes of motors. A handy system of lubrication, which enables the rider to accurately measure the quantity of oil delivered to the crank chamber, is smart. It consists of a glass cylinder with a central rod or spindle having a valve at each end, and when screwed down the oil enters the chamber from the tank; when screwed up it shuts off the tank and opens the connection to the crank chamber. The action of applying the brake cuts off the current, and this can be graduated to suit the requirements of the rider.



The New Bowden Motor Bicycle.

24d. The Clissold Cycle Co., London. Double stand for use when cycle is standing or at rest. The handlebar being fitted with a roller and cord permits of the drawing up of a pair of small wheels attached to a bracket, to be used in traffic and slow riding when it is required, either to stand still or proceed so slowly to render the balance difficult.

111. D. Citroen, 45, Holborn Viaduct, E.C. Minerva motors are this year displayed on a well-designed and somewhat ornate stand, and an excellent, effective show results. The motors shown are the new 2 h.p. Minerva, the 2½ h.p. Minerva, and the 1¾ h.p. Romania. The new 2 h.p. engine is full of improvements. The notable alteration is in the machanical operation of the inlet valve, which, although opinions may differ, is unquestionably an effective, reliable and efficient method for the induction of the gas. We notice one point to which attention has not yet been called, and that is that the valve stems are lifted by a plunger working in a straight line and not at right angles, as in the earlier pattern engines. The new engine has a plug in place of the compression tap, has the sparking-plug immediately over the inlet valve, has all angles removed from the exhaust pipe, and is fed through a very neat and simple spray carburetter. A milled-headed nut permits of throttling of the engine, but this is open to improvement, so that it can be worked by a lever. For those who like to drive on the exhaust valve, it is open to fit a Bowden exhaust lifter. The lifting of the valve in order to free the engine is provided for in the present design by the full retardation of the contact breaker. The absence of the lower radiating ribs vastly improves the appearance of the motor. In the 2½ horse-power engine no changes have so far been made, but later on in the new year the mechanically-operated inlet valve will be introduced. The new Romania engine is on old Minerva lines, fed through a spray carburetter, and with a hand lever for lifting the exhaust valve. The motors are all shown in working section, so that even the novice can gain an excellent idea of the motor system. Despite the introduction of their own engines by many motor-bicycle makers, the Minerva engine enjoys even a greater popularity than ever, for it is to be found throughout the shows.

109. J. van Hooydonk, London. One of the earliest makers in the cycle trade to recognise the claims of the motor, J. Van Hooydonk, of Holloway, N., has reaped the reward of his enterprise, and has had the enjoyment of selling Phœnix motorcycles in large quantities, and wherever the Phœnix has gone it has given pleasure and satisfaction to its owner. Mr. Hooydonk is in every sense a practical motor engineer, and his machines, therefore, bear the stamp of his genius, which has been directed to the simplification of the machine, of the work of driving, and of repair or adjustment when need might arise. The standard Phœnix is made in two patterns. The first is driven by a 2 h.p. Minerva engine, with mechanically-operated inlet valve, and the latest of improvements. The lifting of the exhaust valve in the Phœnix is independent of the contact breaker case, being done through a Bowden wire. Spray carburetter is used, and the transmission is by a three-ply V-shaped belt of chrome-dressed leather. A new form of belt fastener is adopted, in which the fraying of the hole in the belt is avoided. The oil pump is elevated on the top tube of frame, and the feeding of the lubricant is certain and easy. The front forks are trussed. Two accumulators are carried in each machine, and the petrol capacity is two gallons. The 2½ h.p. machine has a Longuemare carburetter, with levers to adjust both air and gas, and the admission of hot exhaust gas for warming the carburetter can be regulated as necessary. The silencer is particularly good. The "Trimo," the latest Phœnix production, is really a combination of a cycle and light car. A fore-carriage, with a nicely-upholstered body, well hung, is borne on a pair of wheels, and is bolted to the cycle frame at four points, converting the cycle into a three-wheeled car. The steering is connected to the front forks. A few minutes' work, including replacing the front wheel, re-converts the machine into a bicycle. The front seat of the Trimo is very comfortable, and is certainly an improvement upon the trailer. The Trimo is priced at £65. With wicker body it is £5 cheaper. The Phœnix tandem has the engine (2½ h.p.) centrally placed in a cradle, is fed through a Longuemare carburetter, and is exceedingly well-designed and easy to control. The number of Phœnix lady-back tandems in use show the popularity of this type.

47. The Swain Patents Syndicate, Horwich, Lancs. Here are to be found the Swain and Horwich Tyres. The special advantages claimed for these are durability, speed, ease of manipulation—there being no wires—and freedom from punctures. They are built up expressly for motor work, a special feature being that both covers are interchangeable, and they fit any of the standard pattern rims.

56. Clipper Pneumatic Tyre Co., Coventry. Here are found motor tyres of all descriptions, their speciality for motor-cyclists being the Reflex motor-bicycle tyre, which is made in 26 and 28 by two inch sizes, and similar in pattern to their ordinary Clipper-Reflex, so well known to riders of the pedal-propelled cycle. The tyre is built up of specially strengthened fabrics, and there is ample thickness of rubber on the tread. Their tyres are mostly supplied on a special motor Westwood rim.

50. Continental Caoutchouc and Gutta Percha Co., 64-5, Holborn Viaduct This exhibit will be the first to catch one's eye on entering the Hall from the Upper Street entrance, its general appearance being very pretty. A good show of motor tyres will be found here, and as the price of their motor-bicycle tyres has been considerably reduced, there is but little doubt there will be a larger market for them. all tyres being thoroughly tested before being sent out. The company are making a speciality this season of repairs to all kinds and makes of motor tyres.

58. Palmer Tyre, Ltd., Birmingham. The motorcycle tyres at this stand are well worthy of inspection. The well-known Palmer Fabric is used, every thread being separated and cushioned in vulcanised rubber, which renders them very resilient. The tread is very thick and almost puncture-proof, ordinary tacks failing to find their way to the inner tube. The Palmer is moulded to a special shape, so that when inflated, the rubber is under compression, and the tyre takes a form entirely different to that of other tyres. This perhaps accounts for the absence of side-slip, which is practically unknown with this new tyre.

29a. Cheswright and Co., London, S.E., show the Lamaudiere motor-bicycle, constructed by the French company of that name, of Paris. The engine forms in itself part of the frame, viz., the diagonal, has an outside fly-wheel and is of 2¼ h.p., driving with a raw hide twisted belt, the underside passing over a jockey pulley, which can be adjusted from the top bar by a lever with a ratchet stop action. The spray carburetter is of novel form, the spirit being delivered on gauze wire; there is an adjustable drum above the gauze wire which regulates the air supply, and is operated by a lever on the top bar. The carburetter is enclosed within a chamber, which is heated by the exhaust gases. Alcohol or other spirits can be used with this carburetter. An exhaust lift is fitted, and the switch is within the left handle. A notable feature is that the driving pulley is one piece with the rim, the back brake acting on the driving drum. Considerable ingenuity has been displayed to render this machine a very compact as well as strong one.

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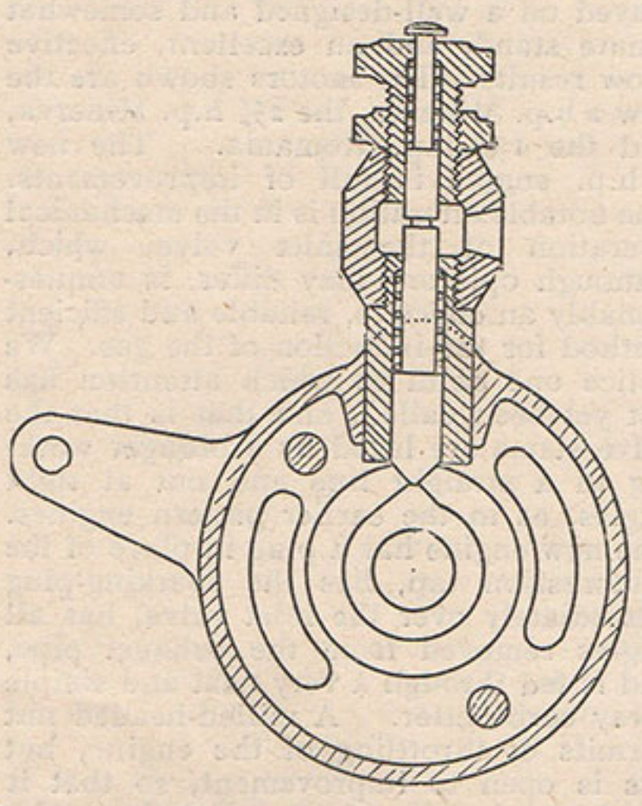
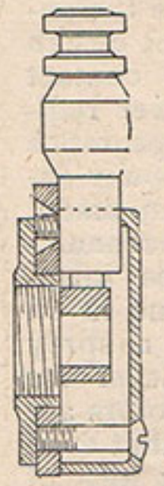
157. Steiner and Co., London, E.C. A very large range of horns is here shown, with one of which is combined an oil lamp, placed in the mouth end; another shows an acetylene lamp combined in the same manner. The Powerful and Motocyclite acetylene lamps, both of which burn six hours, and the Belmont, which has made a reputation, are three good lights.

167. The Garrard Mfg. Co., Birmingham, have five complete machines on show, and the actual four-cylinder machine that went up Gaillon Hill at 62 miles per hour. There are two of the chain drivers and one belt drive pattern shown. The well-known featherweight motor is shown in section, and all the parts can be readily inspected. The two-speed gear machine and parts can also be critically examined. The chain driver, with two speeds, has been exhaustively tested, and is a really fine piece of work. Minor improvements have been introduced into the belt driver, chiefly in the disposition of the accumulator and tool bag. The new contact breaker, known as the Garrard-Maxfield, is a distinct improvement. The demand for the featherweight sets and machines complete is, we hear, very great, and the firm is working at high pressure to cope with the demand. The construction of the Garrard-Maxfield Contact will be readily understood from the illustrations. It is designed to give an exceedingly quick break. This is effected by two spring-controlled plungers separating the platinum contacts so quickly as to prevent the formation of an "arc" between them, with the consequent rapid wear and weak secondary spark. This new principle the firm claim to give splendid results, firing the motor at even the high speed of 3,000 revolutions a minute even with two volts only on the primary. We intend putting one of these new fitments to a practical test shortly. It is readily attached to standard C.G. motors by simply unscrewing the old pattern contact breaker and replacing with the new one. It is highly finished and small in size.



Garrard-Maxfield Contact Breaker with cover removed, showing springs and plungers.



Section of G. M. contact breaker showing base plate and cam.

64. The London Machinists Co., Kingsland. This firm show the Royal Sovereign motor-bicycle, built throughout in their factory at Kingsland. The engine, which is vertical, is contained in a horizontal loop, to which it is securely bolted. The forward part of the loop is brazed to the main down tube, whilst the back part forms the bottom bracket. Surface carburetter, silent exhaust, and one lever controls the valve lifter and advance sparking. The wheel base is extra long, and a very steady machine is thus secured.

130. Goodyear Tyre and Rubber Co, 5, 6, and 7, Singer Street, Tabernacle Street, E.C. This firm are making their special motor-bicycle tyres in sizes 26 by 2, 28 by 1¾, and 28 by 2. The system employed in fastening is their well-known form of braided wire, i.e., a flat band of fine braided wire, which lies in either edge of the outer cover. The act of inflating the cover decreases the circumference of the band by increasing its width. This causes the tyre to contract on the rim. The firm's well-known form of motorcar tyre, with detachable side flanges, is also shown.

86. The Crypto Works Co., Ltd., have five motor-bicycles on show. These include three Crypto 2¼ h.p. and one 2¾ h.p. machines, and a featherweight, fitted with the Clement-Garrard motor. The engines of 2¼ and 2¾ horse-power are fitted in a vertical position, right in the centre of the frame. An ingenious switch and combined exhaust valve lifter is good. A special Longuemare carburetter is used, and the Lincona belt fitted. The petrol tank is of neat design and large capacity. The control levers are within easy reach of the rider's hands on the horizontal tube. A silencer of large dimensions is used, and wheels, hubs, and all frame parts are of extra strength. Dunlop or Clipper tyres are fitted at option, and the price of the 2¼ horse-power is £50, and the 2¾ £65. A Bowden back rim and a lever front rim are fitted, and the finish of the exhibit leaves nothing to be desired.

227. Alfred Dunhill, London, N.W. The name of Dunhill has become a household word in the motor-cycling world, as the moment one takes up motor-cycling it must not be forgotten that the extra speed attained necessitates extra clothing, and Mr. Dunhill is the man who has set himself out to supply the requirements in the most thorough manner. We have not space to refer to his many productions in the way of caps, goggles, leggings, etc., so must select one or two for special mention. We first inspected the M.C. Semi-Breeches in cloth-lined twill material, and also in leather. These breeches are in the form of overalls, and whilst having the appearance of knickers, can be much more readily put on and taken off. One of the most useful of Mr. Dunhill's articles for the use of motor-cyclists is his Umbrella Cape. There are no buttons on this whatever. You just stick your head through a hole, and there you are! It consists of a long loose cape of waterproof material, the neck consisting solely of rubber. The cape folds up into a very small space, and should find a place in all motor-cyclists' outfits, as it proves invaluable when the elements suddenly turn unkind, and the rain begins to fall—as it did on that memorable anniversary run to Oxford.

29c. East London Rubber Co., London, show a bicycle fitted with the Kerry engine, in a loop which allows the engine to be placed low, and at the same time sufficiently forward to get a good length of belt drive, an automatic carburetter is fitted. The main feature aimed at has been to produce a neat machine, coupled with cheapness, 38 guineas retail. At the same time, nothing has been sacrificed as to strength and simplicity.

168. The Bowden Brake Co,, Ltd., London, provide excellently for the braking of motorcycles, the famous Bowden wire being made of extra strength. The new Bowden front rim brake is made in two forms, one actuated by a lever, and the other by the Bowden wire. In the latter a very neatly-concealed spring is used, and the brake should become popular in either form. Both are very easily attached. The old cycling crack, R. J. Ilsley, was met here, and reports fine prospects for the new season.

92 Imperial Cycle and Motor Co., Birmingham. The motor-bicycle on show at this stand has a neat appearance, the case, containing the accumulator, trembler coil, petrol, lubricating tanks, and carburetter, being of polished mahogany, a contrast to the metal cases we are so accustomed to see. The machine is fitted with a 2 h.p. engine in the inclined position. One lever operates the compression, mixture and sparking. The tank will hold sufficient petrol for a 100 miles ride. An automatic lubricator is fitted, and a very efficient silencer is carried underneath the bottom bracket. Price £42.

187. Salsbury and Son, Ltd., London, W.C. This firm entered early into the supply of motor accessories, and a very large range of such articles is shown here. The new rear light lamp, of insignificant weight, with red light, is a useful introduction. Leather coats and breeches, lighter than the usual sort, are introduced. A very powerful but neat horn is shown, the trumpet portion being bent to the form of the handlebar; the attachment of this is very good. The Invincible oil lamp for motor-bicycles is excellently designed for its purpose, and has an oil well of extra size. The E.I.C. sparking-plug is sold by this firm.

232. The Reliance Engineering Co., Southampton. "Death to Vibration" is the motto this company has adopted, and so far as motorcycles are concerned they claim to have overcome this by means of their "N. A. B." anti-vibrating seat pillars and handlebars. The seat pillar consists of a combination of spring and balls, which not only absorb the vibration but the balls surrounding the plunger, serving the purpose of breaking up the friction at any point of contact, so ensuring the perfect working of the spring. In fact, the makers claim that so thoroughly does the device take up the vibration that no springs in the saddle are required. The peculiarity of the pillar is that the spring-controlled telescopic tubes are pressed out in fluted sections to form seven longitudinal grooves, each accommodating a vertical row of steel balls. The Reliance Company have also adapted their arrangement to handlebars, with the result that motor-cycling over bumpy roads on a machine fitted with these ingenious devices loses much of its disagreeableness.

112. The Triumph Cycle Co., Ltd., Coventry, show their specially built frame fitted with the latest pattern Minerva engine, and they have fitted a very clever arrangement for regulating the throttle valve. A rod is fitted to the top rail to the throttle valve, the top end being serrated with a number of notches into which engage a small spring governing the amount of lifting.

29b. Oldsmobile Co., Ltd., London, show a motor-bicycle fitted with the Royal motor which is mounted within four tubes, which form the underside of the seat pillar. It has a steel cylinder, whilst the radiator fins are vertical and hollow, allowing the air to pass up freely. These fins are brazed top and bottom of the cylinder. Royal atomizer is used, which is composed of double chambers; these effectively spray the petrol. A novel form of silencer consists of a tube stopped at the end, having a large number of minute holes, the whole tube being bound with copper wire. The result is an almost complete absence of noise with the exhaust; 42 ampere hour accumulators are supplied, and the petrol tank is for 110 miles running. Two brakes of powerful construction are fitted; the whole of the working is done by two levers, close to the handlebars, the switch being on the left-hand. The drive is by one chain alone. The well-known Oldsmobile light car is also on view.

91. Werner Motors, Ltd., 151a, Regent Street, have a very fine exhibit, comprising 11 machines. The Werner design has been still further improved for 1903. Two powers are shown, viz., 2 h.p. and 2¾ h.p. The carburetter is now fitted with a throttle, and is much neater than last season. All machines are Paris-built throughout, and the finish is most excellent, and will satisfy the most critical inspection. Brake gear is very substantial, the front rim brake being at once simple and most effective, and the rear brake is constructed on an entirely new principle. The tank has been altered in design, the accumulator being now placed in a centre compartment, and the capacity of the largest size tank is 150 miles; contact breaker and pulley also are quite on new principles. The tyres are Dunlop motor-bicycle, specially made for the Werner Company, Limited, with rims of Dunlop-Bartlett section. The free-wheel is on the Morrow principle, and hubs are of special strength. Timing gear is also made stronger, and the regulating levers are all within easy reach. Lubrication details are also improved.

LIGHT MOTORCARS.

We have purposely refrained from going into detail or giving illustrations of light motorcars in the Shows because these will be very fully dealt with in the next issue of "Motor Cycling and Motoring," a great portion of which will be specially devoted to light motorcars. We have been at considerable pains to collate particulars of motorcars that are being made in England and in other countries, and offered to the public at comparatively low prices. and these will all be described and illustrated next week.

144. C. Lohmann, Aldersgate Street, London, E.C. Here we find the well-known Perfecta acetylene lamp, which has given such satisfaction that no alteration has been found necessary. It is, however, now fitted with spring back or fixed back, as desired. Motorcyclist tool-bags are also on view.

142. W. A. Lloyd's Cycle Fittings, Ltd., Birmingham. A motor cycle is exhibited, fitted with one of their own make 2 h.p. engines in which the cylinder and head are cast in one piece. The bore is 2⅝in. and the stroke 2⅞in. The connecting rod end is made in two parts to provide for adjstment on the crank pin. A new contact breaker of registered design is fitted and also a new fork crown. A combination hub, having a ball-bearing rachet free-wheel without springs and a large silencer make up a motorcycle which will no doubt give general satisfaction.

124. The Chase Cycle Co., Birmingham, show a motorcycle, 2¼ horse-power, fitted in a vertical position, within a loop of the frame, of which one side forms the double top bar, and the other joins the loop for motor. Automatic petrol regulator and carburetter, one lever control for exhaust valve and advance sparking. The engine is placed in front of bracket to ensure a long belt drive, and an outer ball-bearing on the driving pulley is provided, which prevents straining of the crank shaft.

153. Miller and Co., Ltd., Birmingham. The Edlite, the lamp specially adapted for motorcycles, is now fitted, when desired, with a prismatic lens. It is made in two sizes. A combination red and white light lamp is shown in which the red glass normally attached in front of the reflecting cone may be turned on its hinge against the side of the lamp, out of the way, and is retained in this position by a catch. The transparent lens is fitted at the inner end of the reflecting cone, which is held in position by a split spring ring, thus enabling the cone and lens to be removed for cleaning. Some large "Arclite" acetylene lamps for cars are also shown.

30. The Kitto Automobile Co., Ltd., Chiswick, S.W. The machines shown by this firm are of their well--known narrow type, and adapted so that the engine takes the place of the usual pillar tube, it being fixed at the bottom end to the bracket and the down tube, and at the top end by a clip into which the seat pillar fits. The engine is 3¼ horse-power, and has combined mixing valve and throttle, or can be supplied with a float feed and spray carburetter. The top tube carries the lubricating oil, and the engine is supplied by a small force pump. There is a single lever to control the exhaust valve lifter and advance sparking. The battery and coil are clamped round the down tube, whilst the petrol tank is on the down stays. An exhaust box, capable of being cleaned, is an advantage. The driving pulley is securely fastened to the rim of the back wheel, not to the spokes. A provision is made within the driving pulley on the motor to catch any oil which might work through the bearings. The prices range from 30 guineas for the 2⅛ horse-power, to 40 guineas for the 3¼ horse-power.

13 (ARCADE). **R. W. Coan,** Myddelton Street, Clerkenwell, E.C., shows all kinds of castings in aluminium in connection with cycles. Various novelties in the form of souvenirs, badges, medals, etc., may be seen here. Aluminium crank cases for motorcycles are made by Mr. Coan, who guarantees that castings can be made from a customer's own patterns in a single day.

31 (ARCADE). **J. van Hooydonk,** 736, Holloway Road, N., shows the Smith Two-roller Spring Seat-pillar, which has been invented to help overcome the vibration trouble. Another exhibit is the new patent Anti-vibrating Handlebar, in which the springs, being very soft, respond to the merest unevenness of the road. The double guides make the bar absolutely secure, preventing side play and making it equal to a rigid bar.

32 (ARCADE). **J. N. Birch,** Nuneaton, shows two motor-bicycles, one fitted with Simms' Magneto in conjunction with Birch's advance sparking apparatus. This machine is constructed with Birch's patent combined crank chamber and bottom bracket built in the frame; surface carburetter, belt drive, Birch's disc hubs, and compound brake. The other has a surface carburetter, wipe contact, accumulator, trembler coil, and self-compensating contact.

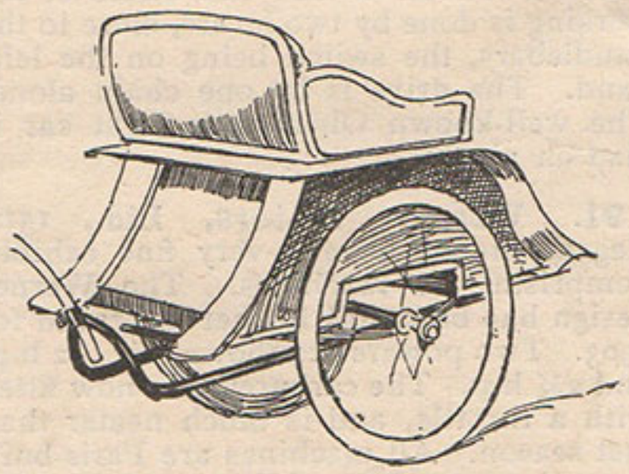
97. John L. Thomas, Barnet, Herts. The Celeripede motorcycle shown here, fitted with a 1½ h.p. Celerimobile engine, 62 bore and stroke, with a two lever control and spray carburetter, should prove a good investment at the moderate figure of £40. Fitted with a Minerva 2 h.p. (1903) engine, the same machine is listed at £45 nett. The weight, 89lbs., does not appear to be excessive. A new type engine will be supplied, with an extra long wheel base, large silencer, and long bearings of large diameter. A motor-tandem (also called the Celeripede), and fitted with a 1½h.p. Minerva engine, belt driven, is also on view. Any of these machines may be supplied with a patent spring fork, which is fixed to the front hub spindle, and by means of which vibration is very considerably lessened.

250. The Birmingham Small Arms Co., Ltd., Birmingham. While not taking up the manufacture of motor-bicycles themselves, the well-known B.S.A. Company are not overlooking the growing popularity of the motor-propelled machine. A set of cycle fittings, specially adapted for the building up of motor-bicycles, was introduced last year. To meet the demand for a frame to stand the strains of the increased power of the motors now being used, and the consequently larger size of tyres, a new set of fittings has been introduced for the 1903 season. An examination of this shows that no point has been overlooked. We were pleased to notice that special attention had been devoted to the question of the strength of the front forks, the failure of which would have disastrous results. The B.S.A. Company have fully recognised this, and with the fork they have produced have no fear of its use with motors up to 2½ horse-power. Another feature of note is that the hubs are not simply those used on cycles, but are made much stronger than usual.

191. The Kent Chain Cover. Here exhibited is a good idea for the protection of the upper surface of the chain. It is composed of a number of spring steel shields which fit one over each link; they clip firmly to the side plates and prevent dirt entering the chain bearings from the outside.

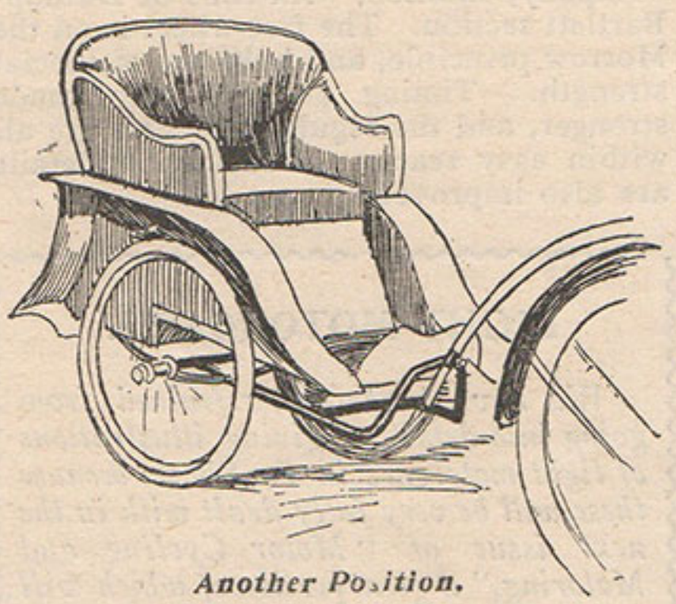
9 (ARCADE). **Sutherland and Marcuson,** Chandos Street, W.C., show some of their latest patterns of Umpire ignition cells for motorcycles, motorcars, etc., also various types of "Umpire" batteries and accessories for same. In conjunction with their batteries, this firm are now sending out an improved form of variable resistance, which it is claimed supplies a long-felt want.

68. New Coventry Eagle Co., Coventry, have struck out on entirely new lines. A big loop frame with long wheel base is used, and the motor is placed well forward of the crank bracket in an upright position. The engine develops 2¼ h.p., has a one-piece cylinder and combustion head, and is fed through a spray carburetter. The silencing is intended to be effective, and certainly we have not yet seen so large an exhaust box on any other



The Reversible Trailer.—One Position.

machine. The tank is capable of holding 1½ gallons of petrol, and space is allowed for battery and oil, whilst the coil is carried by an aluminium bracket. The oil feed is by gravity, and is visible to the rider. Transmission is by a V-shaped three-ply belt. Ample brake power is provided, and both the front rim brake and back Bowden brake are operated from the one lever. The front forks are of the accepted girder pattern,



Another Position.

and the mudguards are of ample width. The 2¼ h.p. engine sells at £50, and with a 1¾ h.p. engine at 45 guineas. The whole of the workmanship and design of the 1903 Coventry Eagle are distinctly creditable to the manufacturers, and we anticipate a very big demand for the machine. The new motorcycle trailer has a fine carriage-built body, with big storage room for touring purposes. An important feature of this trailer is that it is reversible, as our sketches show.

17 (ARCADE). **Davis Allen and Co.,** London, E.C. From a motor point of view, the interest at this stand centres on the Mitchell motor-bicycle, of which about half a dozen are staged. This machine, although an American production, is already so well known in this country as not to require a lengthy description. Suffice it to say, that the motor is of 2 h.p., and is located within the frame on the lower tube, driving rear wheel by a belt. Early in the year Rogers, an American expert, gave a demonstration of the speed capabilities of these machines on the track at the Crystal Palace, while in the recent anniversary run to Oxford of the A.C.G.B. I. a Mitchell gave a good account of itself notwithstanding the awful weather experienced.

120. W. R. McTaggart, Ltd., Dublin, show the F.N. motor-bicycle. This year the power has been increased to 2 horse-power, the weight of the machine even now being only 90lbs. The engine is placed vertically by means of an ingenious hoop in the lower diagonal of the frame, this enabling a longer belt, which is of the flat type. The well-known F.N. carburetter is, of course, fitted, the pattern remaining the same as last year. The advance sparking lever is provided with a series of nicks, which not only keeps the lever in position, but enables the driver to regulate the explosion to a nicety. A small compensation box is fitted, of clever construction, which maintains an equilibrium within it. A tube formed in the shape of the letter C is contained with its upper part outside the box, whilst the other is within it, thus any splash of oil into the box, which is connected at the bottom end to the crank chamber, is thrown back by the establishment of the equilibrium within and without. The make and break contact is the special design of this firm.

126. The Princeps Autocar Co., Northampton. The whole machine is of different design and construction to that lately made by this firm. The single cylinder is of 2¼ h.p., and is cast in one piece, with top radiators going to the centre to effect the greatest amount of cooling. The crank chamber is bolted to the frame by tee-shaped feet, having four bolts in each, thus making the frame and engine very rigid. A special form of combined float feed carburetter and regulator is fitted. An entire absence of wiring and levers render this machine extremely pleasing to the eye. A slight movement of the front lever serves to break the current. The engine drives either by belting (Lincona) or by chain gear. This firm is also showing a twin engine of 4 h.p., fitted vertically in a similar manner to the single engine, with the advantage of its occupying no more space than the single type. It also shows an expanding form of a motor pulley of the V type. By pressing together of the sides of the V the belt is forced outwards, thus giving an increased speed of some 25 per cent. as a maximum; it also gives a free engine. In the chain-driven type a spring compensating wheel is used to take up the jar of starting and a friction clutch to give a free engine. The inlet valves are either fitted to work mechanically or automatically, according to the desire of the purchaser.

5-6 (ARCADE). **Calverts Motor Cycle Co., Ltd.,** Kingsland Road, N.E., show various novelties and sundries connected with the motor industry. Two motor-cycles are on view, both fitted with a Calvert engine of 2¼ horse-power, and weighing 110lbs. There may be seen special trembler coils for high speed engines, one giving forth a spark over ½in. long. Among the items to be seen are two-stroke petrol engines for motorcycles and cars, giving 3 horse-power at 1,200 revolutions per minute.

29 (ARCADE). **James Dawson and Son, Ltd.,** Lincoln, show specimens of their well-known "Lincona" belt for motorcycles. It is claimed for this belt that it does not stretch, slip or break, and preserves the bearings, and wears longer than any other. The company are showing the belt which has accomplished a 10,000 miles' record. Other specialities on view are fasteners, pulleys, rims, and dressings, suitable for the fitting of "Lincona," the latter having the double purpose of keeping the band supple during wet weather and also of contracting the fibres of the leather, thereby taking up any slight stretch which may occur in working.

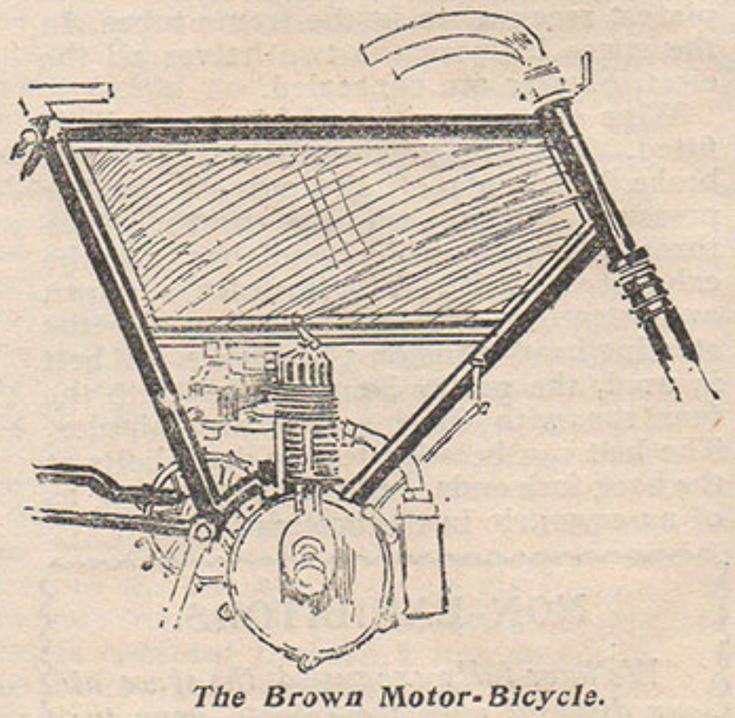
194. Joseph Lucas, Ltd., Birmingham, This firm, with their "motoralities," are catering for the wants of motor-cyclists and motorists generally in an enterprising manner. Among the many lamps, from a huge headlight downwards, we note a new acetylene gas lamp specially designed for use on motor-bicycles. The Wells-Lucas "Motoil" is shown in a variety of qualities, each adapted for its special purpose, the Motoil A for the engines of motor-bicycles being now made up in pint tins. The motor-cyclist may here take his choice between bells and horns of all sizes, while if touring inclined he will find all he wants in the way of luggage-carriers, tool-bags, etc. Lifting jacks, spanners, tyre levers, grease injectors, motor tyre valves, inflators, etc., all find a place on Messrs. Lucas's stand. Among the oil cans we note a new pattern known as the "Forced Feed," specially designed for ensuring the oil being forced to the desired part.

73. A. W. Gamage and Co., Ltd., Holborn, are showing four Gamage motor-bicycles. The crank case of the engine constitutes part of the frame, to which it is bolted up. The engine is 2⅛ horse-power, and has a very long stroke, namely, 80 mm. to a 68 mm. bore. The compression tap is opened by a twisting handle on left handlebar, whilst the one on the right hand advances and retards the ignition. The carburetter is of the spray type, and requires no attention, consequently all levers are avoided. The drive is by a heavy three-ply belt, the driven pulley being fastened firmly to the rim. Pump lubrication is provided, whilst petrol capacity is a little less than a gallon. The machine sells at £40. Of motorcycle and car accessories and spare parts, Messrs. Gamage have made a big feature during the past year, and from the wide and varied range which we saw on view on the stand in the Gallery we should imagine that no motor-cyclist need go farther than the Holborn emporium for any spare part or fitting that he might require. In clothing and outfitting, specially suited to the pastime, there is a wide selection, and it may be said with truth that the capacity of all pockets can be suited by Messrs. Gamage.

141. Perry and Co., Birmingham. show special parts for motor-bicycle frame building, including hubs, crank brackets, chains, fork crowns, free-wheels, spokes, nipples, lubricators, spanners, brake gear, and complete frames. Their trailing car fittings are worthy of special attention, and the general finish of all Messrs. Perry's work could not be excelled.

103. The James Cycle Co., Ltd., Birmingham, stage two motor-bicycles. The Model T has a 2 h.p. Minerva motor. An exceedingly strong fork crown and duplex forks are points that call for special notice. The other model has a 2½ h.p. Minerva motor fitted on to a special frame. This machine has a surface carburetter, extra powerful brake work, and the special spoking of the wheels call for attention. The finish of both machines is very handsome, the rims being nickelled, with green lacquered centres and edges.

28. Brown Bros.' show is one bristling with interest for the motor-cyclist. Five Brown motor-bicycles are shown, including the old pattern 1¾ horse-power, and the new vertical motor of 2 horse-power. This has a spray carburetter, and very large tank capacity. Control is effected by two levers only. One machine has the 2 h.p. Minerva engine fitted. Car motors of various powers, and an 8 h.p. Brown



The Brown Motor-Bicycle.

car are shown. A motor-tricycle on De Dion lines finds a place, and in addition to these every motor fitting or accessory in practical use is shown, including coils, accumulators, standard parts of motors, lamps, jacks, motor clothing, lubricators, belting, electric wire, frame parts for motor-bicycles, lubricants, pumps, chains, gear wheels, etc.

93. New Hudson Cycle Co., Birmingham. Two very serviceable looking motor-bicycles are to be seen here, one fitted with a vertical 2 h.p. De Dion engine, embodying all the latest improvements, including their special silencer. The motor is clamped to the down tube, and in addition is supported behind from the bracket and seat tube. A special point about this motor is that it gives a much narrower tread than usual. The other machine shown is fitted with the latest pattern 2 h.p. Minerva engine. Both machines have their special tubular stays to the front forks, spray carburetters, automatic lubrication, and are finished in the usual style for which this enterprising firm are noted. Price of either machine £45.

137. Granoli and Lacoste, Boulevarde, Magenta, Paris, have a special exhibit of electrical accessories for motor-bicycles and cars. These include coils, both of the trembler and non-trembler class, accumulators of various sizes, sparking-plugs, contact breakers, switch handles, electric wire, spark advance gear, etc. A special line, worth close inspection, is the firm's accumulator charging attachment for an electric light circuit. A visit to this stand will prove instructive and interesting to motorists generally.

23. The A. V. Motor Co., Birmingham. The A.V. motor-bicycle engine, in 1¾ size, is exhibited on a machine built of B.S.A. fittings; the engine clips on to the down tube of the bicycle frame *a la* Minerva; a spray carburetter is used, but perhaps the feature which catches the eye is the tank, which is made of polished oak, and decidedly adds to the appearance of the machine; petrol, oil, coil, accumulators, and spare tools are accommodated within this tank, which also contains the carburetter. A belt drive is used, the belt being of twisted raw hide.

75. The Monopole Cycle and Carriage Co., Coventry, are showing a couple of motorcycles, the engine of 2¼ h.p. being placed in a slanting position below the lower member of the frame. A spray carburetter is provided, and the drive is by a three-ply V-shaped belt. The tank is of large size, nearly filling the opening of the frame, giving room for oil, accumulators, and coil, and for a large supply of petrol. A Bowden exhaust lifter is used, and two brakes are provided, one being the New Departure coaster.

96. The Riley Cycle Co., Coventry, are showing a very powerful-looking motor-bicycle, fitted with an M.M.C. engine, 2¾ horse-power, which they are making their standard pattern. A special feature of this machine is a very strong triple head. A front band and a rear back-pedalling brake are fitted. To this machine is attached a specially-built motor trailer, with double backbone, and a spring attachment. Another machine, fitted with 2½ Minerva, is also shown, with tandem attachment, which can be taken on and off in a few minutes, and is well worth inspection. This can be fitted to any of these machines at slight extra cost.

19 (ARCADE). **Price's Patent Candle Co., Ltd.,** Battersea. No motor-cyclist needs reminding that this old-established concern has devoted special attention, under the direction of Mr. Veitch Wilson, to the question of the lubrication of motors and the various parts of motorcycles and cars that need attention of this kind. Price's motorine is now largely used, the B brand being that intended for use with small air-cooled motors; it is put up in quart tins. For the chains of motorcycles "Rangraphine" is specially recommended, acting not only as a lubricant, but as a protection against rust. Messrs. Price publish a pamphlet on "Lubrication of Motor Vehicles and Cycles," and as this contains a vast amount of useful information those readers who have not yet got a copy would do well to write for one. Any motorcyclist who may meet with trouble in the matter of lubrication will always find a sympathiser in Mr. Wilson, who will endeavour to rectify the trouble.

177-178. The Eadie Manufacturing Co., Redditch. The Eadie fittings which have made such a name in cycle construction are well employed for making up a smart motorcycle. Only the frame parts, hubs, etc., are supplied, and they are adapted for use with the current makes of motors from 1½ h.p. to 2½ h.p. The front forks compel one's admiration for their sturdy and effective design. A very large D section tube tapers to a round section as the curve begins, and the fork is strengthened by taper tubes from the fork crown to top of head. The rear carriage is equally well designed, and the hubs, although obviously strong, are not unduly large or wide.

8. The Ideal Meyra Electric Co., London. This firm show specimens of their dry batteries, accumulators, and coils for motor ignition, also their motor signal lamp. This is an electric lamp, with powerful lens, and two coloured glass slides, red and green, either of which can be utilised; with the white light, the lamp can be used for examining the engine, gear, etc., in the dark; the light can be brought in contact with petrol fumes without the slightest danger. It is worked by a 6-volt accumulator, and runs for 36 hours on one charge; the accumulator slides in the box, and makes its own connection, the terminals of the accumulator coming in sliding contact with two brass strips inside the box, which is provided with a leather handle for carrying purposes. It is claimed for the F. and J. accumulators that they have a maximum capacity with a minimum weight.

179. Leatheries, Ltd., Birmingham. The two types of motor saddles staged by this firm are the British Pattisson Hygienic saddles and the Empire. The former is of very striking design, and takes our fancy as a really easy seat, four spiral springs of considerable height providing ample movement at the back; the seat is wide and may be contracted and expanded to the rider's requirements; the bifurcated top is, of course, especially advantageous for the motor-cyclist. The Empire is also of special design, especially as to its lower frame, which provides a strong base of neat appearance. Tool and accessory bags are shown in various sizes, a large one with several divisions attracting our special attention.

1. (MINOR HALL). **The Starley Motor-bicycle.** A new motor-bicycle appeared on the stand of the Houk Automobile Co., Ltd., late on Saturday. This was the Starley motor-bicycle for 1903. The frame is specially designed to take the engine, a tube runs from the top of head to a point on the strut, just above the bracket, and two twin tubes run from bottom of head to same point: the vertical engine is carried on an extension in front of the bracket. Each of the three triangles of the frame contains a tank, the forward one holding the oil, the tank in the main panel containing petrol, and a wooden box between strut and back wheel carries the coil and accumulators. Spray carburetter is fitted, warmed by hot air from the front of the cylinder. A drip-lubricator is fitted, the drip being variable by means of a lever on the oil tank. The low tension wires are contained in the frame tubes; this makes for neatness. A gear-case is fitted to this machine.

C16

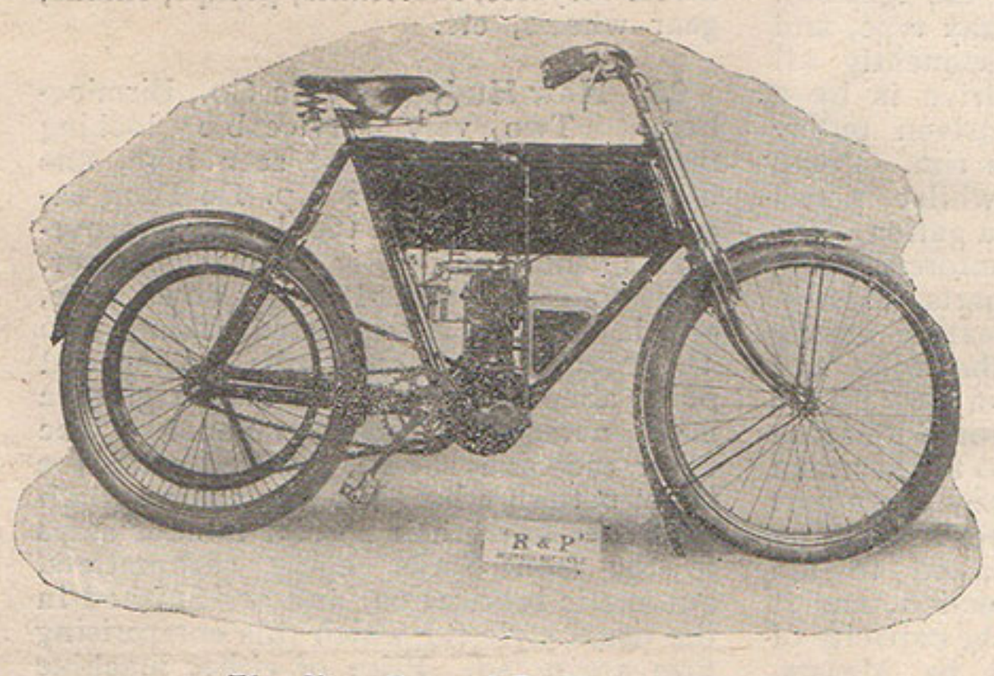
22. The London Autocar Co., London. A large assortment of motor parts and sundries, De Dion and Allard engines, lamps, etc.; also the L.A.C. set of rough castings, which are supplied to the trade for making up a 2 h.p. motor-bicycle engine. The London Autocar Company carry a stock of Ducellier motor lamps in all sizes, also sparking plugs, jacks; in fact, everything the heart of either novice or expert could desire.

102. Robinson and Price, Ltd., Chatham Street, Liverpool. Two specimens of the "R. and P." motor-bicycle are shown. These embody such new and special features that we deem the machine worthy of a full description. The bottom bracket and engine crank case are all cast in one piece, with socket lugs for the chain stays, tube from head, and strut of frame. The left side of the crank case is detachable by removing six bolts. The 2 1-8 h.p. engine is vertical; the silencer is of triangular shape, and is made of layers of aluminium and asbestos to prevent resonance. A spray carburetter is fitted, the air-regulating lever coming up through the tank. The rear portion of the tank is an oil reservoir; on turning a tap underneath, the oil drips through a sight-glass and through a large diameter copper-pipe to the crank case; the rate of drip can be regulated by a set screw. This is a very valuable and original feature. The tank is made in two pieces, recessed to fit the frame tubes. In the space between the two halves all the electric wires are concealed.

Wipe contact, with trembler on coil, is fitted. The first touch on the front wheel brake lever cuts off the current, further pressure putting on the brake. The throttle lever is on the handlebar, also the exhaust valve lift. The front forks, crown and steering tube are substantial; the steering head turns on 3-8in. balls. V belt is used, the pulley being spoked into the rear rim with short spokes and nipples. The belt can be adjusted by draw-bolts at the back fork ends, and the chain by means of an eccentric in the bottom bracket.

NON-EXHIBITORS.

We have fully exhausted the space at our disposal with the reports upon the exhibis at both Shows, and are therefore unable to describe in detail the special features of the machines now being shown in London by non-exhibiting firms. These, however, we shall very fully deal with in our next issue.



The New R. and P. Motor-Bicycle.

24b. Maurice Gnapp, Dunstable, Beds., shows a cup drawer, which is of an adjustable form, capable of extracting the tightest cup in the bottom bracket of a cycle or motor. Also a useful form of lapping tool for making joints, extremely useful to the frame builder.

16 (ARCADE). **The Petrol Motor Power Co.,** London, E.C. The novelty at this stand is an American motor-bicycle, known as the "Indian." The motor—of 2 actual horse-power—is built in the frame in such a way that it practically forms the seat tube of the frame. The "mixture" is furnished by a special float-feed carburetter. The machine is chain-driven, one chain connecting the motor with a chain wheel on a sleeve on the bottom bracket spindle, a second chain connecting this with the rear wheel. On the other side of the chain stays the usual chain and free-wheel is provided for starting the motor. Apart from the handle switch, there are only two levers, one acting on the throttle and the other advancing and retarding the sparking. A feature of the latter is that when the spark is retarded to the utmost the exhaust valve is lifted.

7. Collier Twin Tyre Co. Ltd., London, W.C. The Collier pneumatic tyres are shown here in sections for all weights of motors. The system of fastening is the well-known "bolted on" method. A solid wire runs inside the foot of the tyre, inside a spiral coiled wire, which protects the actual tyre from being torn when the single wire is tightened. This is done by means of a number of threaded bolts, which come through the rim; these have eyelet holes in the heads, through which the wire passes, and nuts on the ends which project through the rim. A tool is provided to fit these nuts, after undoing which the tyre readily comes away from the rim. The tread is arched, rendering the tyre less liable to side slip, and making it clean, from a dust-throwing point of view. In the recent 4,000 miles tyre trials, promoted by the Automobile Club, the Collier scored 48—the lowest number of marks for attention to tyres, one mark being deducted for every minute devoted to the tyres during the run, either for inflation, repairs, or any other cause. During the whole run, the set of Collier tyres suffered but one puncture. This was caused by a huge nail. The air-tubes out of the two front tyres are shown on the stand at the Show; these two tubes were never re-inflated from start to finish of the 4,000 miles. The covers are in the possession of the Automobile Club, so that they cannot be exhibited, but are still in perfect condition. Mr. W. G. Williams is in charge of the Collier stand.

Special Notice.

Several tyre companies are exhibiting at both Shows. Their exhibits are, of course, practically the same at the Stanley as at the National, and as we reported the Crystal Palace Show first their goods will be found reviewed amongst the reports of that Show.

THE MOTOR EXHIBITS AT THE NATIONAL SHOW.

The National Cycle and Motor Show, which opened its doors to the public on Friday last, is the eleventh of the series held at the Crystal Palace, under the auspices of the Cycle and Motor Trades' Association. The following reports deal exclusively with the Motor Exhibits, which are interesting and well worthy of inspection. The Cycling Exhibits are very fully dealt with in "Cycling."

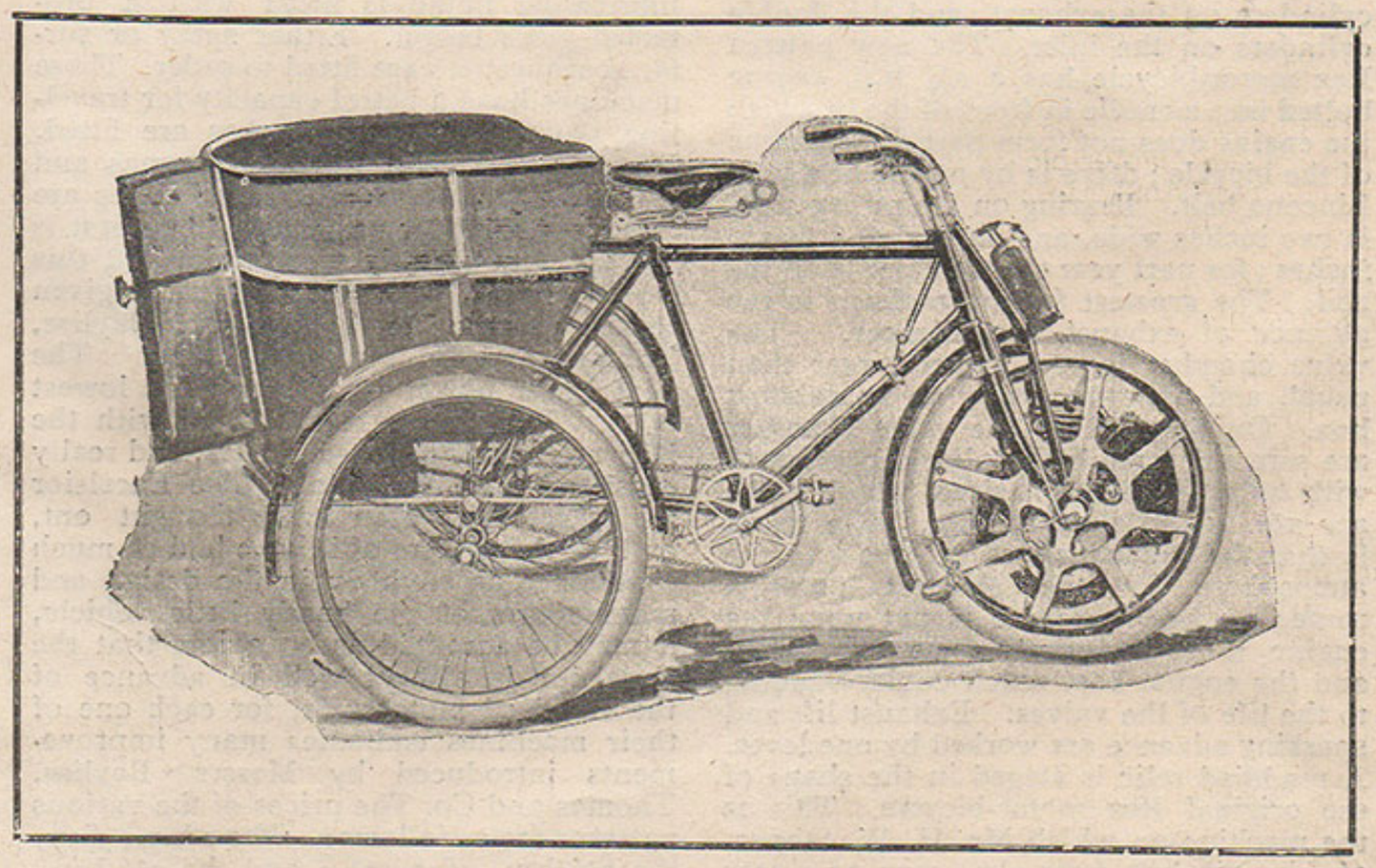
62-3. The Centaur Cycle Co., Coventry, show one specimen of their new pattern chain-driven motor-bicycle, to which a Humber engine is fitted, driving by means of two chains, and the interposition of a spring chain wheel, to absorb the shocks of the engine. Another pattern with 3 h.p. engine, fitted to a frame of the well-known Centaur featherweight design, will soon be on the market. Centaur motor-bicycles all have the patent anti-vibrator head, with rubber buffers at the crown—between the crown and the fork blades, in fact. Prices of Centaur motor-bicycles for 1903 are 50 guineas for the 2 h.p., and 60 the 3 h.p.

9-10. Quadrant Cycle Co., Ltd., Birmingham. The new engine which the Quadrant Company are showing exhibits many new and attractive features, irrespective of the general design of the whole machine. The bottom diagonal is made in loop form, and the engine, which is vertical, is fitted securely to both members of this looped tube. Engines of two and three h.p. are fitted. A surface carburetter, accumulator, and coil are contained in a case secured to the top tube. The make and brake contact is very efficient, being of completely new design, and the motions of advance sparking and exhaust valve lifter are operated by one lever. Great care has been taken to prevent the oil from exuding from the crank chamber, and a very neat arrangement to prevent this has been adopted. A hole is drilled through the crank axle, which permits a free current of air to pass in or out, and, naturally, with a free supply of air to the inside of the crank chamber, little or no oil will be likely to rise. The exhaust valve is made to rotate on its seat, thus preventing undue wear, and by the constant turning of the valve grinding in becomes unnecessary. An entire absence of external wiring adds much to the general appearance of the whole machine, care having been taken to conceal as much as possible those wires which are usually so much in evidence. At the same time, nothing has been done to affect the general utility of the arrangements. An extra switch lever has been attached to the front brake, so that the slightest movement of the lever breaks the contact, an arrangement particularly useful for traffic riding. A back-pedalling band brake of the Quadrant Company's own design, as well as a powerful front rim brake, are supplied. Pump lubrication is adopted, and Clincher motor tyres are fitted. The 2 h.p. is listed at £50, and the 3 h.p. at £60.

68-9. Singer Cycle Co., Coventry. The new Singer chain-driven motor-bicycle makes its bow to the public. This pattern is bristling with new features. The engine is, of course, situated within the back wheel, in accordance with Singer practice. By an ingenious device one side of the wheel is dispensed with, the remaining side running on a wide triple ball bearing; this leaves the engine particularly accessible. The drive starts from a pinion on the right or exposed side of the engine, and is conveyed by a chain to a chain wheel at the bottom bracket, this being keyed to a hollow countershaft, running on roller-bearings within the bottom bracket (which is provided with an eccentric for adjusting both the chains), the drive is taken up on the other end of the countershaft by another chain wheel and chain running direct to the back road wheel, and driving same; here being interposed a special spring buffer chain wheel, the coiled springs in which absorb all driving shocks from the engine; beneath this spring buffer chain wheel a free-wheel clutch of ordinary pattern is fitted.

The bicycle and engine are started in the following way:—A crypto gear is fitted to the left-hand side of the bottom bracket; the central toothed wheel of this gear is conected through a free clutch to the hollow countershaft previously referred to, and, therefore, when pedalling is resorted to for starting purposes the reducing gear of the engine is converted into an increasing gear of normal pedalling ratio. To summarise the points gained: free engine for coasting hills; silent but positive chain transmission; and very smooth drive. All the salient points of the Singer motor wheel are retained. The spare petrol tank is now connected with the carburetter by a pipe, giving petrol capacity for a non-stop run of at least 100 miles. This pattern is made in 2 and 3 h.p. sizes. The ordinary Singer motor wheel, as previously known, is fitted to tricycles, bicycles and tri-voiturettes, of which specimens are shown fitted with basket and coach-built seats for the lay passenger; and another new type of the tri-voiturette is fitted with a small coach-built governess cart body, with accommodation for two passengers. The Singer motor tandem is also shown.

92-3. Dunlop Pneumatic Tyre Co show examples of their Bartlett tyre adapted for the motor-bicycle. It is practically of the same pattern and construction as those shown and used during the past year. The heavy covers of the Gordon-Bennett type make a good and interesting show, especially those used by S. F. Edge and C. Jarrott on their racing cars.



The Singer Motor Tricycle fitted to Governess cart body.

17. Harry Parkyn, Ltd., Wolverhampton, are the makers of the Olympic cycles, and they have adopted the latest pattern Minerva motor to their design of frame, which has been strengthened so as to take the extra strains brought to bear upon it.

4. Wearwell Cycle Co., Wolverhampton. This company fit their own engine of 2½ h.p., and either surface or spray carburetter, as desired. The engine is held by three clamps to the frame, and there is sufficient tank capacity to carry the machine 140 miles. Crabbe front brakes are fitted, and any brake that may be desired on the back wheel. Special pump is fitted, with glass-protected reservoirs, holding sufficient oil for giving one lubrication every 20 miles. The machines have also specially strengthened front forks. Price £40.

94. The Self-Sealing Air Tube Co., Birmingham, have a very fine show of self-sealers, ordinary tubes, and general rubber goods for cycles and motorcycles. A special novelty is the new self-sealing and detachable joint for air tubes which enables a punctured tube to be quickly detached from the wheel without in any way disturbing it in the frame. A special valve attachment is fitted to all tubes, and this is guaranteed air-tight under all possible conditions. Another speciality of the company is the vulcanising of new treads on motor tyres, making them equal to new. For motor tyres the self-sealers and ordinary tubes are shown in two qualities. A good assortment of motorcycle and cycle accessories are shown, as well as specimens of the raw material.

55-6. The Rex Motor Mfg. Co., Ltd., Coventry, show nine of their Rex cars, including a brougham with 10 h.p. single cylinder engine, a tonneau-bodied six-seater, and a landaulette; engines varying from 8 to 18 h.p., and prices from 190 guineas to 385 guineas. A new pattern of small car is the 8 h.p. Rex, with two seats at 190 guineas. This car has wooden wheels of equal size, three speeds, and reverse operated by levers on the driver's right-hand side and a long wheel base. All Rex cars are governed, the single cylinders on the exhaust, and the double cylinders on the inlet. The new pattern Rex motor-bicycle has a 2¾ h.p. engine bolted into a cradle in front of the bracket; the engine does not form part of the frame of the bicycle; drive is by means of a long Lincona belt. Bearing on the pulley side, is two inches wide, and on the off-side 1¾ inches; for next year the trembler is on the coil. The greatest feature perhaps is the absence of exhaust box silencer. The valve chamber is cast rather larger than usual, and acts practically as an exhaust box. On the side of the valve chamber are screwed three baffle plates, perforated with holes of different sizes, which holes are not opposite each other. The result is that the exhaust gases get out into the atmosphere by the shortest possible route; no back pressure is put upon the engine, noise is entirely done away with, and the engine kept much cooler—adding to the life of the valves. Exhaust lift and sparking advance are worked by one lever. A muddied relic is staged in the shape of the original Rex motor-bicycle. This is the machine on which Mr. H. W. Stones, of Lincona belt fame, has won 12 prizes out of 12 mounts during 1902.

C18

118. General Accident Insurance Co., 13, Pall Mall, S.W. This Company undertake insurances of all kinds on motorcars and motorcycles, and rates and all details can be obtained on application at the stall.

148. Rotherham and Sons, Coventry, have an attractive display of lubricators for motorcycles and cars, and tyre pumps of various sizes. Also watches in cases for motorcars and cycles. The parts shown are excellently finished. The firm also supply small electrical fittings, such as terminals, nuts and bolts, etc.

44. The Burlington Carriage Co., London, are showing the De Dietrich 16 h.p. Turcat-Mery system, magnetic ignition, special form of clutch, enabling driver to regulate the gripping power from the dashboard while the car is running. The engine is fitted with very large valve for inlet and exhaust.

16. J. F. James show the Royal Roebuck, fitted with 2¼ motor, a vertical engine, with a loop frame, has an F.N. carburetter, long wheel base, Clincher motor tyres, two accumulators and petrol tank, fitted on top tube, with the coil inside the back diamond, near the seat pillar, New Departure hub, and a front Crabbe brake are fitted. The price, with complete outfit, is 38 guineas. They also show another type, with a Kelecom engine, fitted behind the seat pillar, which necessarily makes the wheel base of good length, a remedy for sideslips. The engine is 1¾, and the price is 36 guineas.

14-15. Bayliss, Thomas and Co., Coventry. A very fine exhibit. No less than 35 motor-bicycles are on view here, their standard pattern fitted with a 2¾ h.p. M.M.C. engine, being very conspicuous. This stand is one of the most tastefully arranged in the show, and all the machines are beautifully finished. The motor-bicycles are fitted with triple heads, fully strengthened front forks, special A1 Clincher motor tyres, and wider bracket, giving more clearance to engine. A very neat and most effective lubricating pump is fitted with a protected glass barrel. Either spray or surface carburetters are fitted to order. These machines have a petrol capacity for travelling 150 miles. Two brakes are fitted, Bowden back, and Bayliss, Thomas and Co.'s own on the front. Three styles are being supplied for next year. The first is the 2¾ h.p. already mentioned, and this would appear, from the prominence given to the pattern, to be Messrs. Bayliss, Thomas and Co.'s standard size. The next lower power is 2¼, and the lowest is 2. Both of these are fitted with the Minerva engine of those powers, and really excellent value is given. The Excelsior motorcycle has been well thought out, and, as the makers of it have had as much experience as anybody in the design and manufacture of the handy little vehicle, it may be accepted as an axiom that the Excelsior is always well in advance of the standard motorcycle, for each one of their machines embodies many improvements introduced by Messrs. Bayliss, Thomas and Co. The prices of the various patterns are as follows:—The 2 h.p., £45; the 2¼ h.p., £47 10s.; and the 2¾ h.p., £55.

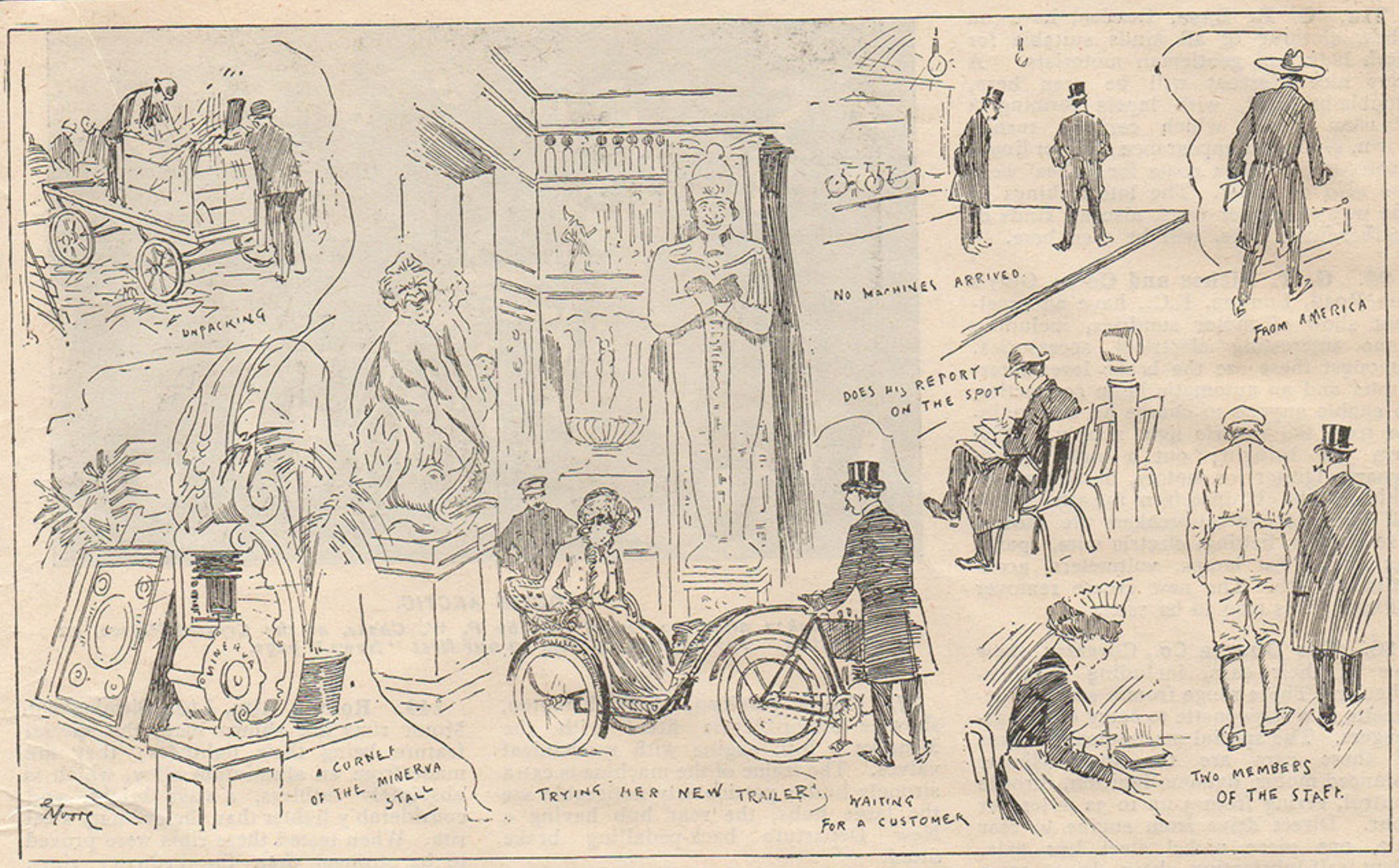
26. The Cologne Accumulator Works, Kalk, near Cologne, Germany, have a compact exhibit of motorcar ignition cells. These are fitted with non-corrosive terminals, and have vulcanite cases.

49-50. The Beaufort Motor Co., 14, Baker Street, W., have on show one 6-horse phaeton, two 8-horse tonneaus, one 12-horse tonneau, one 12-horse brougham, and one 18-horse Beaufort Alexandra six-seated car. These are all fitted with Bergmann's magneto electric ignition and compensating brakes throughout, advance spark, and throttle control. The exhaust is worked in conjunction with the retarding and advancing of the ignition. The frames are of the best steel throughout, and the brakes will hold car on any hill, and one lever regulates all change speeds.

124. Peacock and Co., 35, Clerkenwell Road, are showing electric specialities—voltmeters, test lamps, sparking plugs, Fuller batteries for charging, watch-holders. The pocket lamps, at 5s., are very neat articles and useful for looking about car at night. The firm are also agents for Van Raden's woven glass accumulators. A special line is an electric alarm for protecting motor and cycle-houses from burglars. Charging dynamos, controllers for electric cars having three speeds forwards and reverse; motorcar electric flexible leads; electric fans for ventilating motorcar-houses are all specialities well worth inspection.

36. Haynes and Son, Ltd., 17, Goswell Road, Aldersgate Street, London, have two models of the Wartburg cars on exhibition. These are two-seated cars of neat design. No. 1, at 160 guineas, has a 5 h.p. motor water-cooled, and fitted three speeds forward and one backward. Wheels are of the artillery pattern, running on ball bearings. The arrangement of the springs in both models is such that vibration is practically non-existent. The No. 3 car has standard seating accommodation for two, with removable spider seat behind. This model also has a two-cylinder 5 h.p. motor, and all parts are easily accessible, the finish is extra fine, and the colour of the body can be chosen by the customer. This model comes out at 190 guineas.

39. J. Marston and Co, Ltd., Wolverhampton show the Sunbeam Mabley car, a car of unique design, having a 2¾ h.p. De Dion water-cooled engine fitted on the front part of it. The appearance of the body of the car is much like that of the Irish jaunting car, with the exception that instead of the riders being side by side, one is in front of the other, but the passengers enter and leave their seats at the side; the back rider is the driver, and he has all the necessary levers under his direct control, including a very powerful band brake, operated by pushing the foot, instead of the usual method of pressing down. The body is mounted on a four-track frame, very much after the appearance of the old Coventry Rotary cycle frame, with front and back wheels, 26in. diameter, whilst the side ones are 28in. diameter, the 26in. being the steering wheels, are operated by the steering tiller immediately in front of the driver. The drive from the engine is by belt of a good length to the first motion shaft, and thence to the driving wheels by a chain drive.



SOME IMPRESSIONS BY OUR ARTIST AT THE SHOWS.

25. J. B. Brooks and Co., Birmingham. A very large show of saddles of all descriptions suitable for motorcycles. Their B 85, size 3, are specially designed for those ladies who aspire to motorcycling. They also make a special back rest for the riders who desire to take things easy, which can be fitted to either ladies' or gent's saddles. All the saddles before being sent out have a special dressing, which softens the leather and prevents it from becoming hardened. Bags of all kinds suitable for motors will be found on this stand.

119. The Jesmond Cycle Co., Ltd., Newcastle-on-Tyne, are exhibiting three motor-bicycles of 1¾, 2¼, 2½ h.p., with water-cooled heads. The frame is a loop pattern, with vertical engine. The carburetter is a Longuemare spray with throttle. The petrol tank holds 1¼ gallons, and the oil tank holds sufficient for 120 miles. The accumulator is carried in a neat metal case between the back stays and the seat-pillar, and the induction coil is fixed on the second horizontal tube. The front forks are duplex, fitted to a specially strong crown. Two brakes are fitted—a lever rim to the front wheel, and a Bowden rim brake to the rear wheel. The Lincona belt is used, and a clever device provided for getting at the valves easily without having to dismantle the parts. The timing gear is also easily accessible, and two to one wheels are marked, so that timing can always be set accurately. Remarkably little wiring is used, and the finish of the machines is excellent. On the high powered machine the exhaust valve is governed, and speed can be regulated to a nicety in traffic.

5. Harry S. Roberts, Deanshanger, shows the Royal Condor frame, with latest pattern 2 h.p. Minerva, fitted in the usual manner to the down diagonal. The frame is specially designed to take the extra weight and strains, the front forks being trussed up. It is fitted with a New Departure back-pedalling hub and brake on back wheel, with ordinary rim brake on front wheel. One lever controls all the operations. The new pattern Minerva engine has all valves mechanically-operated The drive is by a twisted hide band on to a wheel secured to the spokes of the back wheel. The tyres are 2in. motor Dunlops. Listed at 40 guineas, this machine should command a ready sale.

40-1. Hewetsons Ltd., London. Twelve of the well-known Benz cars, including a 6 h.p. delivery van built for Messrs. William Whiteley, Ltd., are shown here. A new pattern 16 h.p. touring car is shown, with extra roomy tonneau body, two-cylinder horizontal engine in front, water-cooling radiators, occupying the front panel of the bonnet. A novel method of spoking the driving wheels is adopted on all wood-wheeled cars, the spokes being fitted in the hub in such a way as to increase the width, and consequently the strength, at the point at which they enter the hub. A reduced facsimile of the large touring car is the 12 h.p. double cylindered car, with detachable tonneau; this lighter car is priced at £650: this pattern is selling well. The action of putting on either the hand or foot brake disconnects the engine: this is a feature of all the Benz cars. The Hewetson motor-bicycle is not placed on exhibition.

125. Phœnix Accumulators, London, have something distinctly novel in lightweight and high capacity accumulators. The positive electrode is contained in a cylindrical vessel of porous earthenware, and this vessel is hermetically sealed up, thus the positive element is indestructible. The negative electrode is also cylindrical in form, consisting of a core of lead surrounded with the oxide of lead. This is then placed complete in a porous vulcanite case, so that this electrode is also well protected. For traction purposes very high efficiency is claimed for this battery.

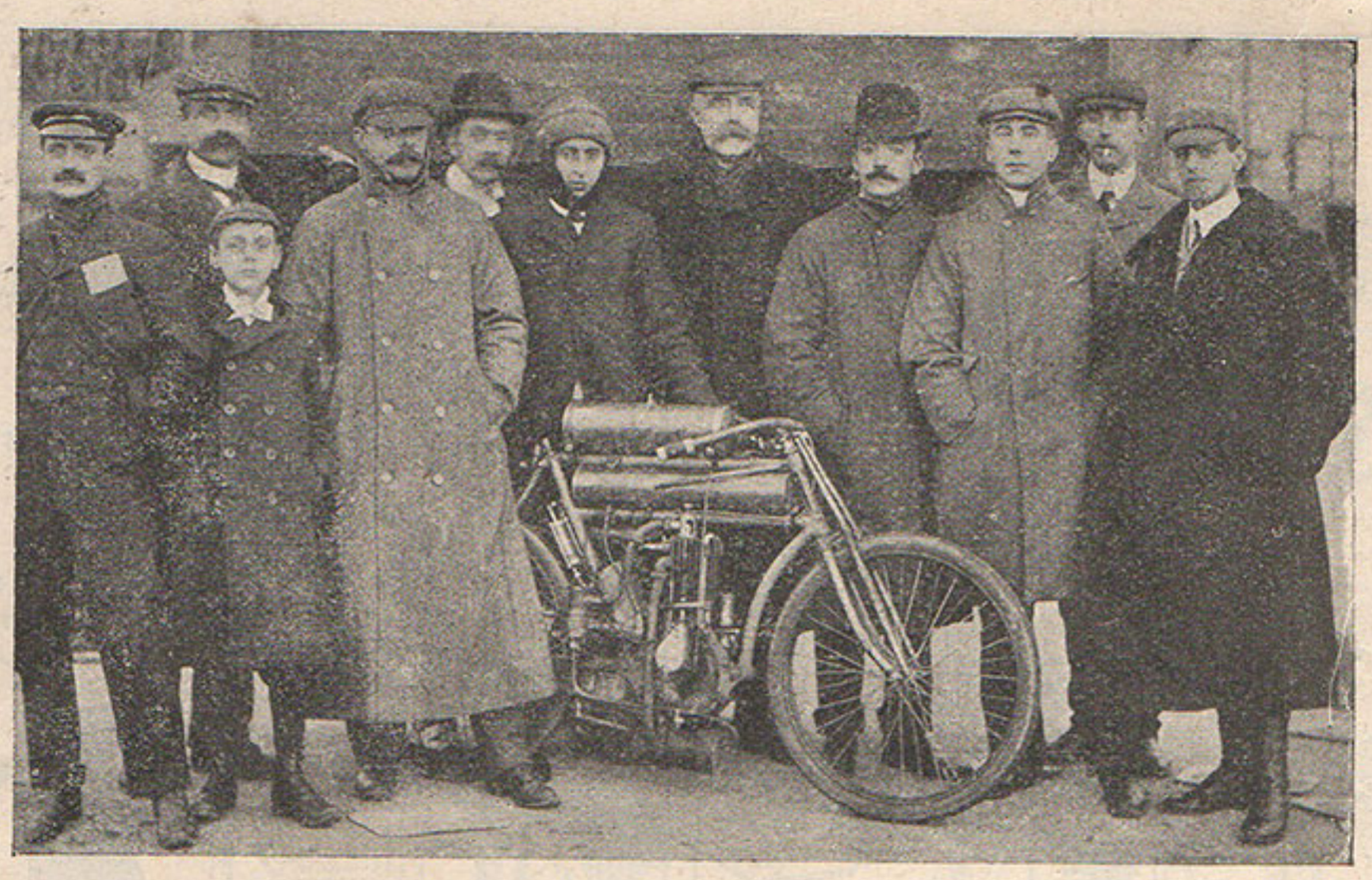
11. Encore Cycle and Motor Co., London. This company exhibit the Trexo trailer; a very neat, twin-tube frame of peculiar design, giving, with a minimum of weight, the maximum of strength. That part of the front member which is next the universal joint is composed of cross tubes, running beside each other, and then bending downwards are brazed to "T" sockets, with a bar running through the latter. At each end of this crossbar a loop frame of round tube is attached, having an angle of some 110 degrees. At the centre of these loop tubes a portion is flattened and, being drilled, carries the spindles of the two wheels; at the same time, the mudguards are fitted within the loops. A good, powerful rim brake, operated by the foot, is fitted, working on both wheels, so as to give the rider in the trailer control over the trailer. A particularly good form of universal joint is fitted, having a fairly strong spiral spring behind the joint. The wicker bodies are strong and well-made, and the comfort of the passenger is fully considered.

21a. C. R. Base, London, have on show clothing of all kinds suitable for both lady and gentleman motorists. A very nice overcoat will be seen here, double-breasted, with lapels forming a Russian collar, which can be turned down, giving the appearance of an ordinary overcoat. Zibeline coats for ladies' wear are also on show. The latest things in the way of leather vests, also all kinds of leather-lined suits, will be seen here.

24. G. T. Riches and Co., 4, Gray's Inn Road, London, E.C., have an excellent show of motor sundries, including some interesting electrical accessories. Amongst these are the brake lever interrupter and an automatic lamp connection to enable anyone to charge an accumulator from the electric light supply. The firm are bringing out a high tension dynamo igniter for motors, particulars of which can be obtained from the attendants. All types of contact-breakers are shown, also pulleys, belting, electric wire, sparking plugs, test lamps, voltmeters, accumulators, etc. The new grease remover "Plaxine" is also to be seen.

38. The Duryea Co., Coventry, show five of their cars, including a three-wheeler. These range from a small phaetonette to a waggonette to carry eight passengers. The special mechanical features of these cars are the three-cylinder balanced motor, dynamo ignition, throttle control, giving from 3 up to 32 miles per hour. Direct drive from engine to rear axle, one piece nickel steel live axle, silent self-lubricating chain drive, extra powerful brakes, large diameter wheels, and tyres, the prices for these cars range from £375 down to £250 for the three-wheeled phaeton. The control of these cars is a unique feature, and is effected by a single lever, by which also the steering is effected, so that the driver controls the car easily with one hand. The large diameter wheels and tyres ensure very smooth running, and vibration is entirely eliminated. All the cars are handsomely finished off in black. The booklet describing the details of the cars is a very instructive one, and well worth perusal. The Duryea car will be further described and illustrated in our next issue.

71. Alldays and Onions, Birmingham are showing a motor-bicycle and a couple of the "Travellers" which have proved so popular. The engine of the motor bicycle is of 2 h.p., and is placed vertically just in front of the crank bracket. The petrol tank is of special design. A spray carburetter is employed, and the transmission will be by means of a flat belt. The Traveller is a three-seated car, two seats at the back and one in front, wheel steering, electric ignition. Four h.p. engine, with water-cooled head, syphon circulation. Two speeds are provided, together with a reverse, the gearing being on Panhard lines. Speed from 4 to 20 miles an hour is possible. Ample strength is provided in all working parts, the axle especially being 1¼in. thick, running on ½in. balls. The inlet valve can always be seen working, whilst it can be bodily removed without touching the induction pipe. Every part is most readily accessible. With upholstered body, the price is £150, and, with open tubular frame seat, £142 10s. The weight of the former is just over five hundredweight, and of the latter just under. Ample brake power is provided.



QUITE ARCTIC.

Group taken after the record ride by F. W. Chase, at the Crystal Palace, on Tuesday last. The event is reported on our first "News" page.

17. Frank Parkyn, Wolverhampton, show a motor-bicycle fitted with the Minerva 2 h.p. engine with mechanical valves. The frame of the machine is extra strongly built; particularly noticeable are the large hubs, the rear hub having a New Departure back-pedalling brake fitted.

95. The Scottish Tyre Co. This company have a complete show of bicycle and motor-bicycle tyres. These are fitted with both the adjustable and the endless wires, and multiflex linings. In the Scottish tyre "de Luxe" for motor-bicycles the rubber and fabric are vulcanised together, and these are of extra strength.

149. Roman Rim, Ltd., Birmingham. Motor rims are shown here, the special feature being their lightness; they are made from an aluminium alloy, which is absolutely ruthless, always bright, and considerably lighter than the ordinary steel rim. When tested these rims were proved to be stronger than the ordinary rims. They are jointless.

116. E. Blundell, Shropshire. On this stand will be found a liquid patching tyre cement, an entirely new composition for repairing inner tubes or outer covers of bicycle or motor tyres without the aid of rubber or chalk. To repair a puncture or burst it is only necessary after sandpapering the tyre to place a small quantity over the hole, allowing it to dry, when the tyre may be inflated. The material is called "Patcho."

22. The Glencairn Motor and Cycle Co., Wandsworth, have a specially designed motor-bicycle on view that is designed for the South African market. It has a 1¾ horse-power motor, and this is fitted with the F.N. spray carburetter. Other features are the Glencairn belt, valve lifter, special front wheel rim brake, New Departure back-pedalling hub brake, B.S.A. cycle fittings, and Clincher tyres. This machine sells at £35, and looks remarkably good value.

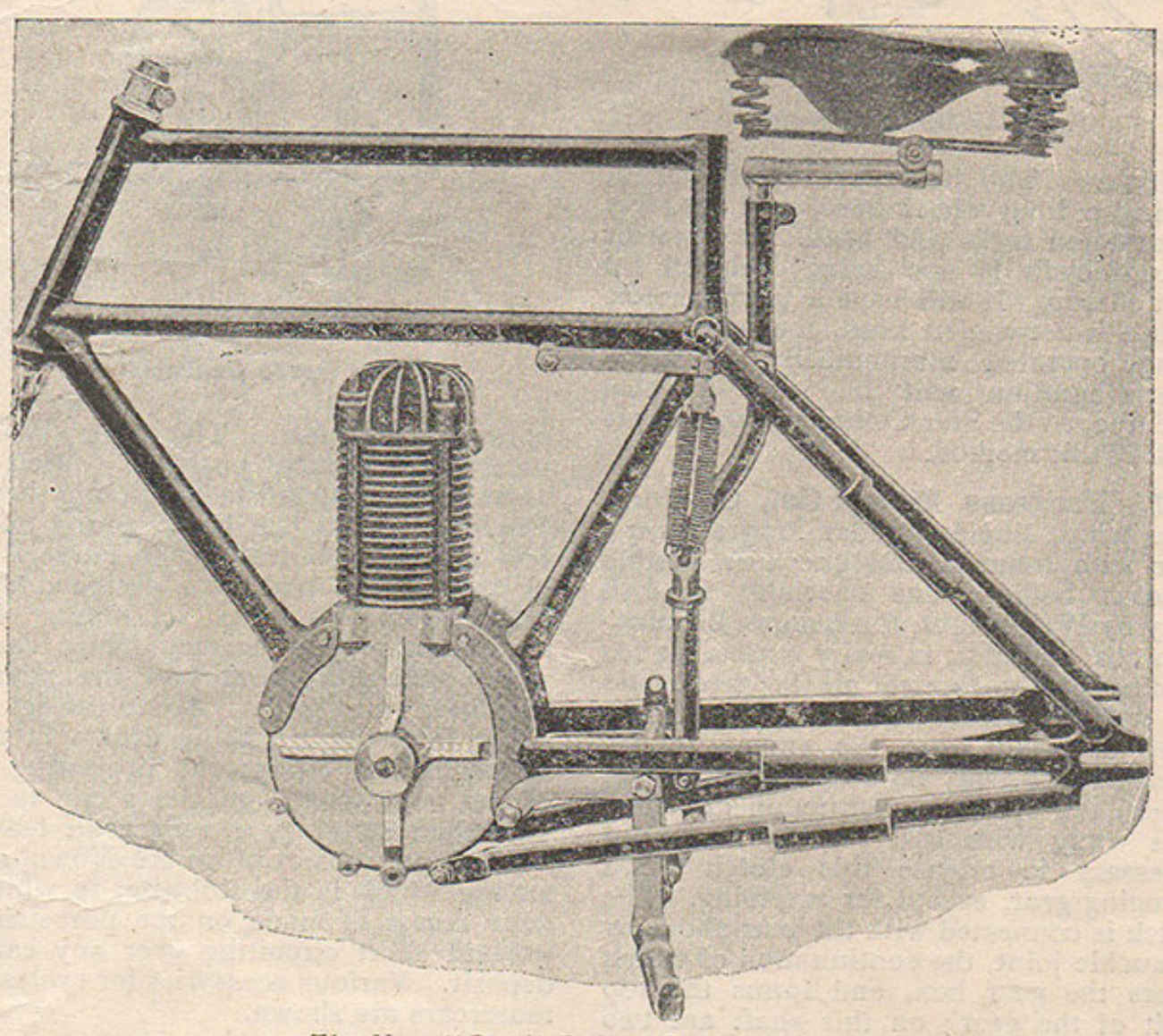
90-91. The Clincher Tyre Co., Edinburgh, have a complete exhibit of their celebrated tyre, which has attained great popularity for motor-bicycle work, in fact, the greater part of the machines on show are fitted with it. The chief features of the tyre are the ease of detachment, and extra hard wearing qualities. The motor-bicycle tyre has a thickness of ¼in. on the tread, and extra fabric giving great strength. In addition to the motor-cycle tyre, a full line of ordinary cycle tyres and carriage and motor tyres are to be seen. Instructive booklets describing the history and method of manipulating the tyre, etc., are obtainable at this stall, and these should be in the hands of everyone interested in detachable tyres. We have had good results from the Clincher on a motorcycle.

115. Dalton and Wade, Coventry, have a complete show of motors, castings, accessories and Minerva tank fittings. Some excellent aluminium radiator castings of special design are well worth inspection. Sections of cylinder castings, gun metal, lubricator castings are also shown. Motor for cycles of 1¾, 2¼ and 2¾ h.p., thoroughly well made and finished, will interest the trade.

42. The General Motor Car Co., Ltd., Norbury and Paris, show two cars, one a tradesman's delivery car, with 4 h.p. motor belt and chain drive; this will carry over 200lbs. at twelve miles an hour easily. The other car is a fast four-seater, handsomely finished. A motor-bicycle is also shown: this is fitted with a free engine and chain drive, and magneto electric ignition. The motor is mounted vertically in the lower angle of frame, and strengthens it considerably. A special feature is the ease with which the machine can be started. All parts of the machine are finished off in nickel, giving it a brilliant appearance.

117. L. Leclercq, of Paris, is showing the Brutus motor of various powers for motorcycles, the engine being constructed on accepted lines. A couple of machines fitted up are shown, and, although neither of them exhibit novel features, it may be said that they are well designed. Thus the spray carburetter is well placed for the best effects to be obtained. The machines are light, and are claimed to be good hill-climbers.

109. The Coventry Chain Co., Dale Street, Coventry, have a very comprehensive exhibit of their specialities from an extremely small chain up to large motor chains, 2⅞in. pitch. A driving chain for motor-bicycles has leather blocks and steel side plates for running over a plain belt pulley on rear wheel. A full set of all sizes of free-wheels, cycle chains, rim brakes, pedals, chain wheels, are shown, and a handy little speciality is the patent coupling for motor-bicycle belts which is unbreakable. Specialities in various types of chains for machinery driving are also shown.



The New "Bat" Patent Spring Frame.

114. The Primus Motor Co., London, are showing three machines fitted with the two stroke motor. This motor has been described in "MOTOR CYCLING," but several improvements have been introduced, notably in the carburetter. The sparking mechanism is improved considerably. The machines are fitted with spring seat pillars and are of good finish throughout. This is the lightest motor-bicycle on the market, scaling only 65 lbs., and the price remarkably reasonable, viz., £27 10s. complete, or outfit £15 15s. For next season the company will have a belt driver on the market, in addition to the front driver; this will have the motor fixed on the main down tube in a vertical position. This type of motor has no valves or timing gear, and its construction is exceedingly simple, moreover, it can be adapted to the average roadster bicycle.

53. Dorman Engineering Co., Northampton. This company are showing motor-bicycles of 2, 2¼, and 3 h.p., the engines (own make) being fitted in either the vertical or inclined position as desired by purchaser. Tanks hold sufficient petrol to carry the machine 110 miles; one lever is for exhaust valve, and the other for advancing spark. Spray carburetters are fitted. The 3 h.p. is water-cooled, and is fixed in vertical position, the water being contained in the front part of the tank with radiating ribs for efficient cooling. A special feature of these machines is that the silencer is carried underneath the bottom bracket, so as to be quite clear of the legs. All machines have triple heads, bottom brackets, and all lugs being specially strengthened. Prices: 2 h.p., £45; 2¼ h.p., £47 5s.; 3 h.p., 55 guineas. Complete sets of castings are also on view.

136. J. Marston, Ltd., Hove. Trailers are shown here, the special feature of which is that the basketwork is woven on to the framework itself, thus obviating the risk of the basket breaking away from the frame, adjustable arm and adjustable ball and socket clip, all being fitted with a lamp clip to show a rear light. Prices from £8 10s.

28. Ilford Motor Car and Cycle Co., High Road, Ilford. A Regina motor-bicycle is here shown, fitted with a 2¾ De Dion engine, in a vertical position. The machine is driven by a Lincona belt, which has a special form of adjustment by a small jockey pulley, depending from the bottom stay, and moving vertically in a slot. Lubrication is by a positive sight-feed pump, which can be operated from the saddle whilst travelling. Two brakes are fitted, front rim and back Bowden.

27. Imperial Motor Co., Brixton Hill, are showing three motor-bicycles all fitted with 2 h.p. motors; the motor is fitted in a vertical position in a loop of the frame. A spray carburetter and extra large silencer are distinctive features. There is a single band brake on the front wheel, and this looks powerful enough for any emergency. The New Palmer motor-bicycle tyre is fitted to this machine: this tyre has an extraordinary thickness of rubber on the tread, and looks particularly strong. A sight feed lubricator is fixed on the diagonal. A special line in ignition accumulators is also shown, as well as McCurd's bicycle jack. A machine ready for the attachment of the motor set is worthy of inspection.

5. Bat Motor Manufacturing Co. of Penge, S.E. The Bat motor-bicycle has only been on the market for a few months, but it has already made an excellent name for itself, for two reasons. The first is that the machine is designed from first to last with the one idea of making a thoroughly reliable, strong, and powerful motor-bicycle, and the second reason is that the machine has developed a wonderful turn of speed, and this is solely due to the complete harmony of the system. The machine has a close, compact frame, firmly stayed for the work. In the No. 1 pattern a 2¾ h.p. De Dion air-cooled motor is employed, and in the No. 2 the power is 2½. The motor is placed vertically in the frame, and a stay runs from the bottom of the motor casing to the rear axle. The power is transmitted through the Bat patent pulley, and a Chicago raw hide belt to the rear wheel. The belt fastener is extremely neat and effective, and the patent switch, operated from the Bowden brake lever, renders the breaking of the current instantaneous. At an extra charge the new patent spring frame can be given, whereby the rider is carried on an insulated portion, and all vibration is avoided by an excellent method. A spray carburetter is used, and a petrol tank of the capacity of 1½ gallons is provided. The machine has neither pedals nor chain gearing, because the rider's power is dispensed with at starting and on the road, as the machine will climb any hill. F. W. Chase has recently done some marvellous performances on the Bat, proving almost without a doubt that it is one of the fastest motor-bicycles (of a reasonable horse-power) in the world. We illustrate the spring frame, and on another page will be found a photo of a group taken on a recent historic occasion.

147. Hans Renold, of Manchester, as a complete line of motorcycle chains from 3-16 inch wide upwards, and motorcar chains up to 2½ inches wide.

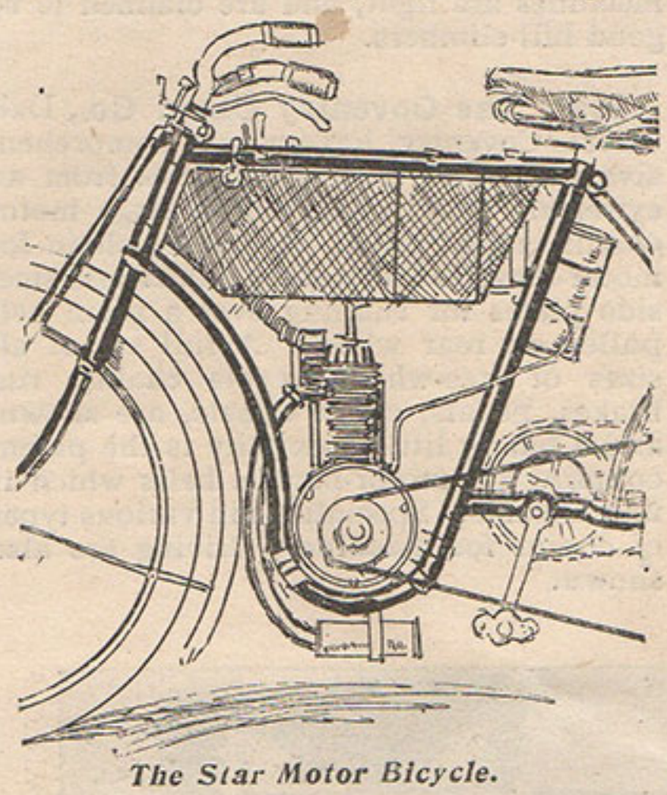
67. Mills and Fulford are showing a very varied assortment of trailers for towing purposes behind cycles and motorcycles. The newest pattern is heavier and more strongly built for use with a motorcycle, the basketwork being closely woven and most comfortably upholstered in coloured leather. The under frame is carried forward from the axle by double tubing to a bridge piece. The connecting tube, or backbone, comes down to this bridge, and the slope of the car can be made suitable to its occupant, and also to the height of the motorcycle frame. It has this other merit that the backbone may be loosened and swung backward, or removed entirely for convenience of railway travelling. The new joint marks an advance on last year's method. The lower plate is brazed to the connecting tube, the ball connecting piece is then socketted between the fixed and the loose plate, and the latter are firmly bolted together. The two halves of the connecting piece are now hinged together, and fastened by a winged nut, thus greatly facilitating attachment and detachment. A couple of juvenile trailers and the new tradesmen's trailers are included in the exhibit. The Millford Hanson is novel. The front forks, steering stem and handlebar of a safety are removed, and the frame of the cycle is attached to the framework of a two-wheeled for carriage the steering bar being on the back of the basket.

12. Raleigh Cycle Co., Nottingham. The new Raleigh motor-bicycle did not make its appearance at the National Show till Monday; it is something quite fresh and different to anything at either Show. A modification of the Raleigh Cross-frame is used, a tube running from the bottom of the head to the main down tube, where it divides, and is carried in duplicate to the back hub. The 2 h.p. engine is situated in front of the bottom bracket, to which it is bolted in four places, and is also supported by two tubes running from the bottom of the head. The drive is taken from a small chain wheel on engine shaft to a larger chain wheel on bracket spindle by a chain. Fastened inside the large chain wheel and running with it, is a belt pulley, and from this the drive is carried by a V belt to a larger pulley on back wheel. The gear is thus reduced in two steps. On the left-hand side is the ordinary chain and chain wheel for starting purposes. The engine can be oiled while in motion by a tap on the top of tank, and the mixture is regulated by another tap in a similar position; all other movements—advance spark, exhaust valve lift, etc., are operated from the handlebar. As a spray carburetter is fitted the mixture requires very little alteration while riding. In the upper panel of the frame is a large but very neat tank, containing petrol, oil, coil, and accumulators. There are no odd fittings festooned about the frame. Altogether the new model is a credit to its designer, Mr. G. P. Mills, and should bring grist to the Raleigh mill.

All the cycle exhibits and other things appealing specially to cyclists are very fully dealt with in the current special Show issue of "Cycling."

C22

8. Star Cycle Co., of Wolverhampton, show four motorcycles for the first time, and they embody some novel features. Three of them have engines of 1¾ h.p., surface carburetter, coil and accumulator ignition. The oil reservoir is part and parcel of the carburetter case, the feed pump being placed close outside. Another pattern has a Simms engine, with magneto

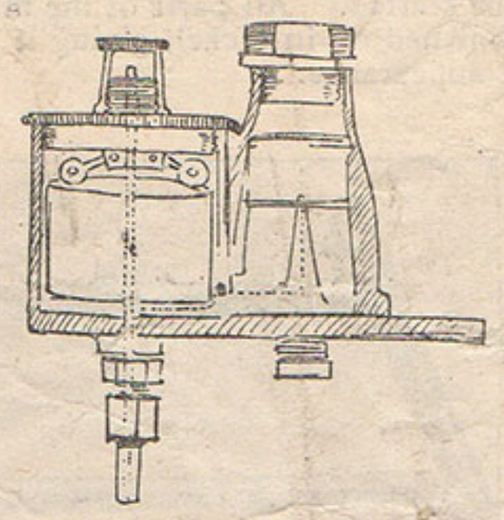


The Star Motor Bicycle.

ignition. The frame is well designed, having a long wheel base, and strongly constructed forks and head. A superior motor-bicycle is now being designed for next season. It will have a 3 h.p. motor, with a water-cooled head, the inlet valve being operated mechanically. Simms-Bosch ignition will be used in this machine, as the Star Company have ample faith in this method.

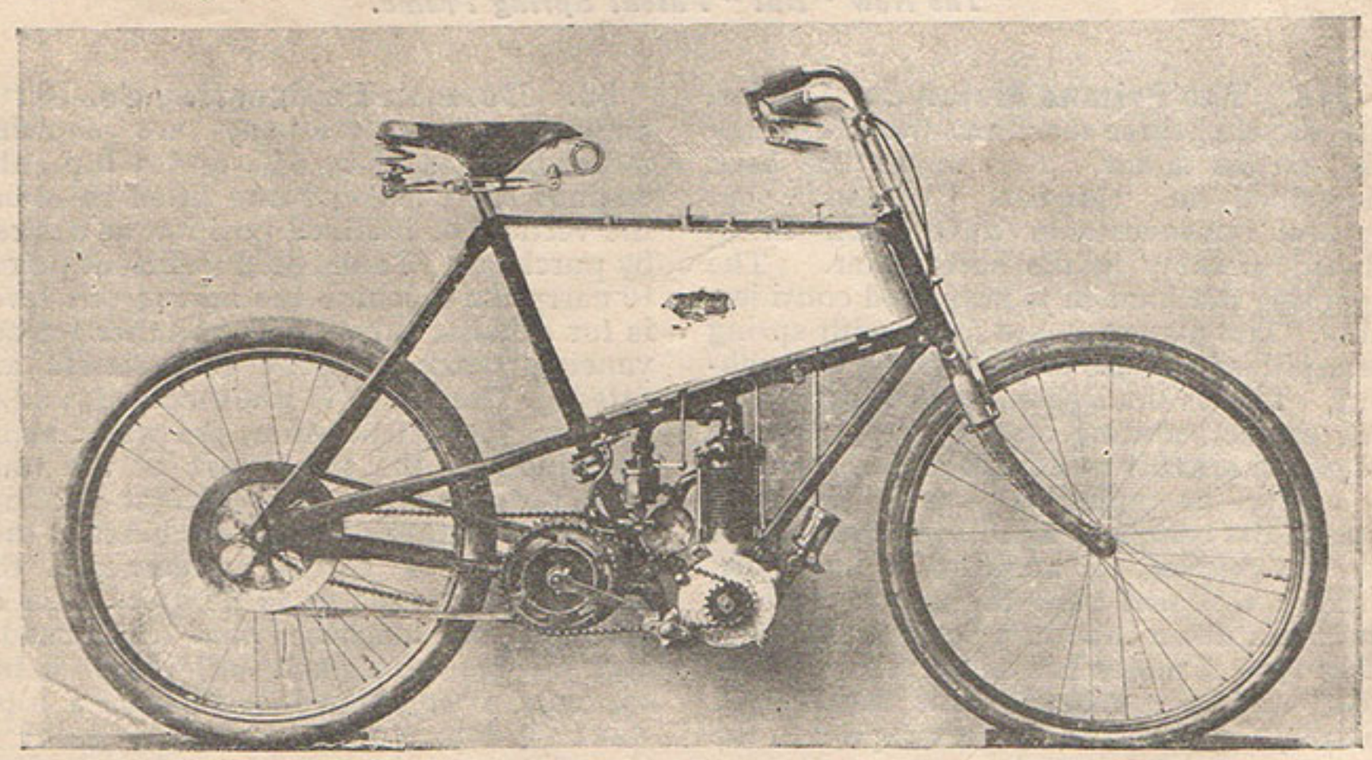
57. Progress Motor Co., Coventry. Five 9 h.p. single cylinder Progress cars, four with tonneau and one with double phaeton bodies; one specially finished body by Wainwright, the famous Birmingham coachbuilder, is really noticeable for its fine finish—though all Progress cars are well finished, for that matter. The drive is taken from the engine to the change speed gear, via a balanced internal clutch, the special construction of which does away with end thrust. It is not necessary to release this clutch when changing gear, except for reversing. The clutch is connected with the gear above by a knuckle joint, the continuation of which enters the gear box, and forms the top shaft of the gear; on this shaft are two steel pinions, gearing into two more gear wheels on the lower shaft, with which they are always in mesh. Two independent clutches are used, and whichever of these clutches is locked (by means of the change speed lever) that particular gear is in action. The pinions being always in mesh, absolute silence in gear changing is obtained. The reverse gear is obtained by sliding a third wheel on lower shaft into gear with an intermediate pinion already running in mesh with a pinion on top shaft. The drive is then transmitted through universally jointed shaft to bevel wheels on back live axle. The main frame is built of 1½ inch steel tube, the inner frame, carrying the engine and gear box, is of channel steel.

123. C. M. Berthe, Colombes, near Paris, is showing a couple of motor-bicycles, one having the engine in the Minerva position, and with no departure from accepted lines except that it has a



The Paree Carburetter.

spray carburetter. The other has the motor in a vertical position. Both patterns will be offered to the public through English agents. A brake acting on the belt pulley is shown. The Paree is one of the neatest and best designed spray carburetters we have yet seen. It is illustrated in the accompanying sketch, which shows the float and the counter-weighted point-feed. Above the jet is a gauze box, the air being drawn in from underneath. Above the projecting end of the point-feed is placed a cap to prevent dust entering, a very good feature. Various patterns of plugs are shown, chief among which is the Robuste, in which a deep recess is made on the porcelain to prevent short circuiting over any carbon deposit. Various acessories for cycles and motorcars are shown.



The New Raleigh Motor Bicycle.

NEWS

Next week.

Our new departure.

The Special Light Car Issue.

Full of interesting information concerning light cars of many countries.

Elsewhere in this issue will be found a complete report of motor exhibits at both shows.

An interesting photograph on another page shows the King of Portugal as a motorist.

Messrs. Friswell, Ltd., have opened their New Free Motor Garage. This is situated just outside Portland Road Station, and a few minutes' walk from Regent Street.

One of the cars in the recent American reliability trials had a horse-shoe suspended in front, presumably for luck, which it apparently brought, as the car got through with a clean record.

The third Show number of "Cycling," issued on Wednesday of this week, is a record in the way of penny cycling papers, as this issue of "MOTOR CYCLING" is in the way of motor journalism.

Two of the largest French motor concerns have opened manufacturing branches just across the German frontier, to avoid paying the heavy import duties the new tariff imposes. The large German clientele justifies these firms undertaking this important venture.

An important alteration in the racing regulations has been foreshadowed by the French Automobile Club, and this will affect ultimately all manufacturers whose cars are taking part in International contests. The maximum weight for a racing car has been fixed at one ton.

An Austrian railway regulation states that the motorcycle is to be considered in the class of "dangerous goods," and each machine has to pay at the rate of a weight of five tons, or for half a waggon. The petrol boycott seems to be spreading, and it needs a strong protest to bring the railway managers to their senses.

Messrs. De Dion Bouton, Ltd., having observed recommendations for the use of 6-volt accumulators in conjunction with their induction coils, wish us to state that their coils are not made to take more than a 4-volt current, and that if a 6-volt accumulator is used there will be very great risk of shorting the coils.

The Gordon-Bennett Contest and Ireland.

If the Automobile Club de France agree to a circular course, there is every probability of the Gordon-Bennett Cup event being run off in Ireland next year. A sub-committee of the A.C. have already inspected a likely course, and apparently the result of their investigations is satisfactory. The official journal publishes a truly glowing picture of the scenes of enthusiasm evoked by such a contest in the Emerald Isle, and of the pecuniary benefits resulting therefrom. A suggestion, too, that kilometre or mile trials be run off in the Phœnix Park is excellent.

The motor-cycling policeman is now a feature in France. We illustrate one of the officers on this page.

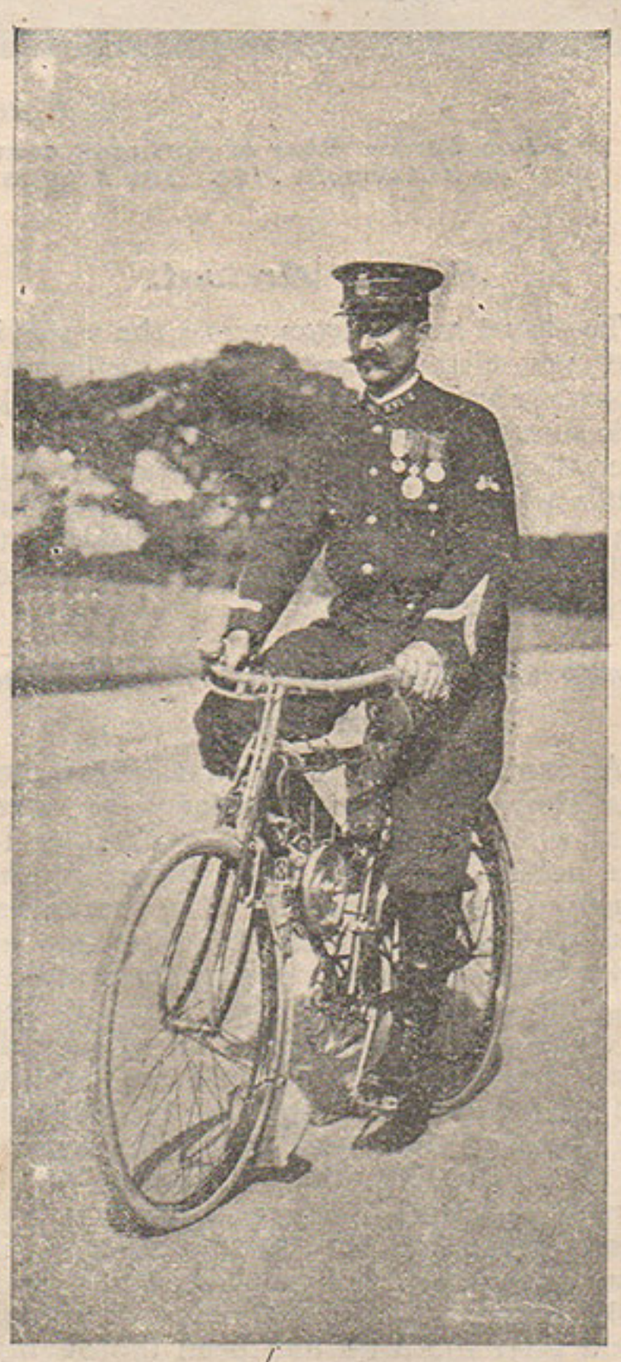
"MOTOR CYCLING" is on sale this week at Stand 20 at the Crystal Palace, and Stand 128 at the Agricultural Hall.

The Shows are a great success. The motor exhibits are varied and most interesting, and are attracting much attention.

We are giving away at both Shows a limited number only of fac-simile copies of No. 1 of "MOTOR CYCLING." These are only being given to applicants.

We are receiving a number of most encouraging letters concerning our intention to widen the scope of this journal. Some of these will be found in our next issue.

The Automobile Club are considering the advisability of fitting up an apparatus at their new motor garage by which the effective horse-power on the road wheels of motorcars may be accurately obtained.



One of the new French motor cycling policemen.

The new De Dion bicycle motor is fully described in this issue. It comprises some new and very striking features.

In bitterly cold weather Fred Chase put in a wonderful motor-bicycle record ride on Tuesday last. It is dealt with elsewhere.

The new illustrated catalogue of the United Motor Industries, Ltd., is a very complete and excellently-compiled one, and should be in the hands of every user of motors.

We inadvertently omitted the price of the "Rubstitute" soap of Messrs. Kay Bros., Ltd., Stockport, from their advertisement the other week. The price is 1s., post free.

A paper called "The Draper" regards the motor movement with scant favour, and remarks that for business purposes the motorcar is not a success. What a set-back—or should we say back-fire?—to our ambitions!

Motor raiment and leather clothing in general was in great demand at the Agricultural Hall, on the opening day; the temperature was like that of a refrigerator, and the draughts were 12 h.p., double cylinder gates.

A new motor garage and repairing depot will shortly be opened in York, and will be known as the York City and County Garage. This will be situated near the Market Place. The proprietors are Messrs. Scaife and Pearson.

After the recent run of the Automobile Club, to Oxford, on which occasion it will be remembered that the weather was—well, er, *not favourable*, Mr. J. van Hooydonk, in cleaning his "Trimo" tandem, got no less than 14 lbs. of mud off the machine!

Under the title "Hermes," a new car will shortly be introduced by the Autocar Construction Co., Ashton-under-Lyne, near Manchester. The car will have a petrol engine of 14 h.p., will be finished and equipped in first-class style and sell at £500. Mr. J. L. Sardy, 8, Snow Hill, London, E.C., will act as agent for the "Hermes" in London and the south.

F. W. Chase and Records.

It was not exactly an ideal day for record attempts on Tuesday week, but F. W. Chase braved the keen easterly wind and did a splendid ride on the Crystal Palace track. Mounted on his 2¾ h.p. Bat motor-bicycle, he covered 228 miles 250 yards in six hours, and only stopped once during the whole ride. He thus beat E. H. Arnott's previous best of 212 miles 586 yards by nearly 16 miles—to be exact, 15 miles 1,424 yards. The distances covered each hour are appended: One hour, 40 miles 210 yards; two hours, 79 miles 378 yards; three hours, 115 miles 335 yards; four hours, 147 miles 1,370 yards; five hours, 189 miles 780 yards; six hours, 228 miles 250 yards. An interesting illustration of this event appears elsewhere.

A New Singer Depot.

The Singer Cycle Co., Ltd., are about to open a depot in Dublin, having purchased the business of their agents, Messrs. Crawford and Evans. They intend to hold a large stock of Singer cycles and mootrcycles.

Motor Abbreviations.

Life is too short nowadays for the average cyclist or motorist to use the full technical terms given to articles associated with these sports. Consequently, as was the case with cycling, the "motor man" is now cutting things down. We noticed that the Riley Cycle Company, in an advertisement appearing in this journal, called their two specialities "Motor-bi" and "Bi-car," the latter being the trailer.

Belt versus Chain.

There seems to be at least one point on which the belt driven machine can claim advantage over the chain and gear driver, namely, the wear on the driving tyre. The direct application of the power without an intermediate elastic transmitter causes the tyre to skid now and again, or revolve without gripping the road. This abrades the tread of the tyre to some extent, whereas with a belt a small amount of slip occurs at the pulley.

Penny Motorcar Fares.

There is now running in conjunction with the motorcar service between Hither Green (Catford) and Lewisham a special car from the latter place to Deptford Broadway (fare, one penny). Judging by the manner in which the public patronise the car, we should say that the outlook for the proprietors is very promising. The buses, which hitherto have had entire monopoly of this route, are now practically empty. The cars used are of German Daimler make, and carry eight passengers, exclusive of driver and conductor.

C.T.C. Discussion.

Arrangements have been made by the Committee of the Metropolitan District Association of the Cyclists' Touring Club for a meeting of the Association at the Crystal Palace on November 26th—the Wednesday in the National Show week. The Directors of the Palace have kindly placed the Concert Room at the disposal of the Committee for that evening, and the Secretary of the National Show is co-operating with them. An interesting programme is being arranged, the principal feature being short lectures and discussions on recent inventions, and novel designs of cycles and motorcycles. The meeting will be open to all members of the C.T.C. and their friends.

That Buyer of a Secondhand Machine.—What he wanted for his £10.

A correspondent is good enough to send us a letter he received in reply to an advertisement he inserted in the sale columns of "MOTOR CYCLING." Here are a few extracts: "Sir,—*Re* your motor-bicycle (it was a £50 Quadrant, by the way), what condition is it in, has it a pump lubricator, and will you accept £10 spot cash? Do you include a portable shed for housing it? If so, you can forward it, cheque by return. Further, I trust it has had little use, as I want a new machine. Can I have it on trial for a month? Is it fast, and does it *kick*? Moreover (in confidence), I might tell you my aunt has left me a large slice of her fortune at her death; therefore I want a fast machine, as she wishes to learn to ride it."—What does this mean? What sinister motive is concealed here?

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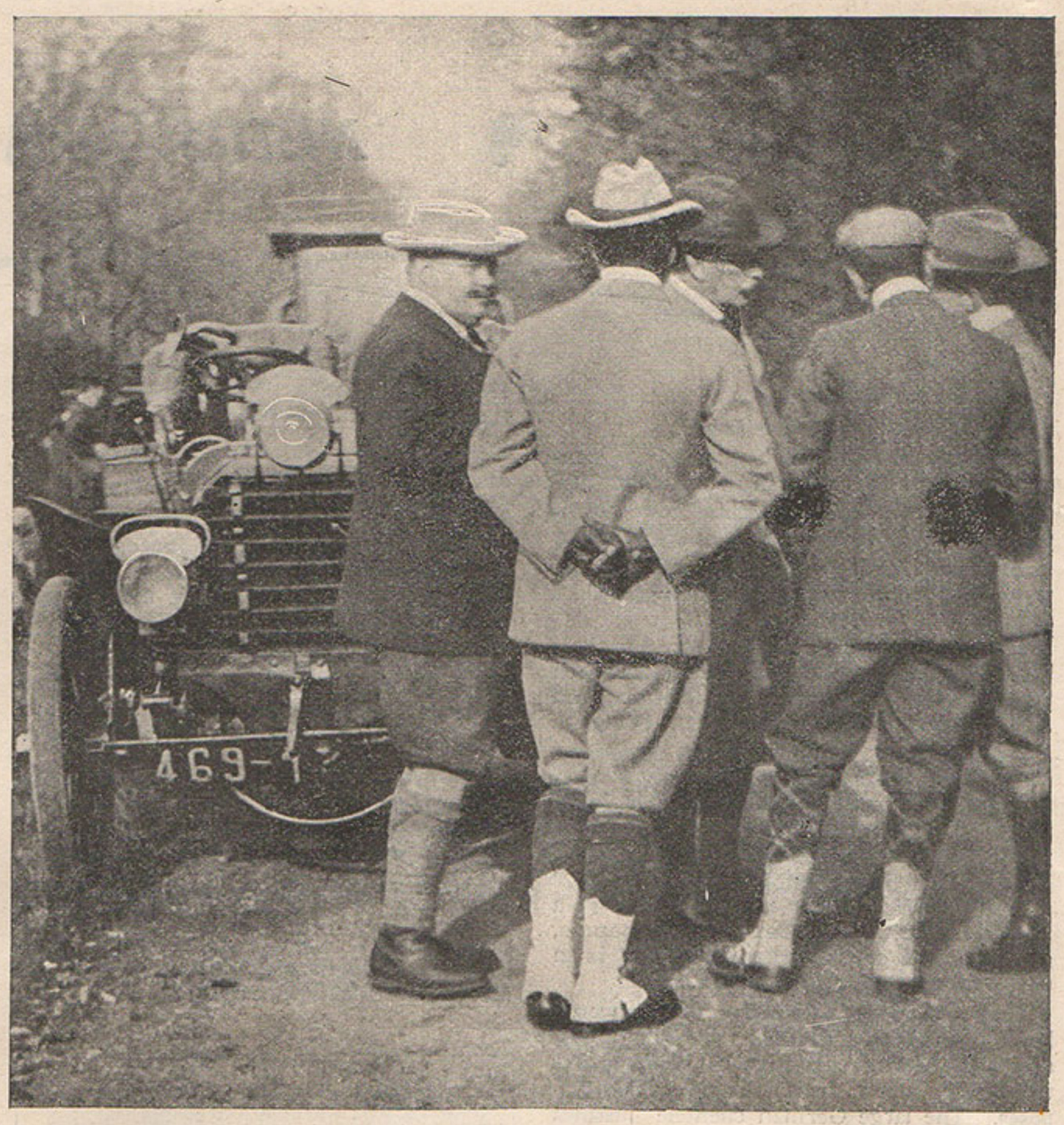


OUR ROYAL GUEST

Don Carlos, King of Portugal, conversing with the Duke du Luynes, after an Automobile ride. The King is on the extreme left in the photograph.

A New Arrival.

The latest arrival from across the water is the new chain-driven Hendee motorcycle, which, we are informed, has met with remarkable success in America. In appearance it is exceptionally neat and taking, and if it only fulfils what the makers claim, should command a big success. We shall endeavour to fully describe and illustrate the new comer in an early issue.

Keep the Combustion Head Free from Mud.

An explanation as to why a tricycle motor has shown a distinct tendency to overheat when on all but light work came to our notice recently. The owner of the machine was no respecter of appearances, and prided himself on the fact that he never bothered about cleaning the machine as long as it went all right; but of late he mentioned it had lost a lot of its old-time speed and life. Could we suggest the cause?—Whilst inspecting the cylinder we observed that there was a thick crust of mud all about the combustion head. Now the purpose of the radiators is to dissipate heat, and this they cannot do if insulated with dried mud, hence it was little wonder that on trying the motor again after the head had been thoroughly cleaned it ran like a different machine altogether.

Ladies and Motor Cycling.

That ladies are taking to motor cycling is now certain, and amongst other firms, the Norton Manufacturing Company, Bromsgrove Street, Birmingham, are making a special type of machine for the fair sex. This is fitted with a Clement-Garrard motor, two-speed gear, spray carburetter, brake switch, and everything simplified as far as possible.

Averse to Wind Shields.

Wind shields have been universally condemned by all the leading cycle champions at present in Paris. The correspondent of a contemporary made enquiries of Elkes, Michael, Bouhours, Lesna, Taylor, Gougoltz, Tommy Hall, Contenet, Cornet, and many others, all of whom agree that wind shields leave the chances of the rider to the pacing machine, and not with the cyclist.

Disqualified.

The Executive Committee of the Automobile Club have decided to disqualify the former winner of the prize in the five miles handicap for motor-bicycles, held at Canning Town, on Aug. 23rd last, and award the prize to Mr. W. Parry, who rode a 2½ h.p. Minerva machine. The Committee were of opinion that competitors should understand that the greatest accuracy must be observed in stating on the entry forms the exact measurements of their machines.

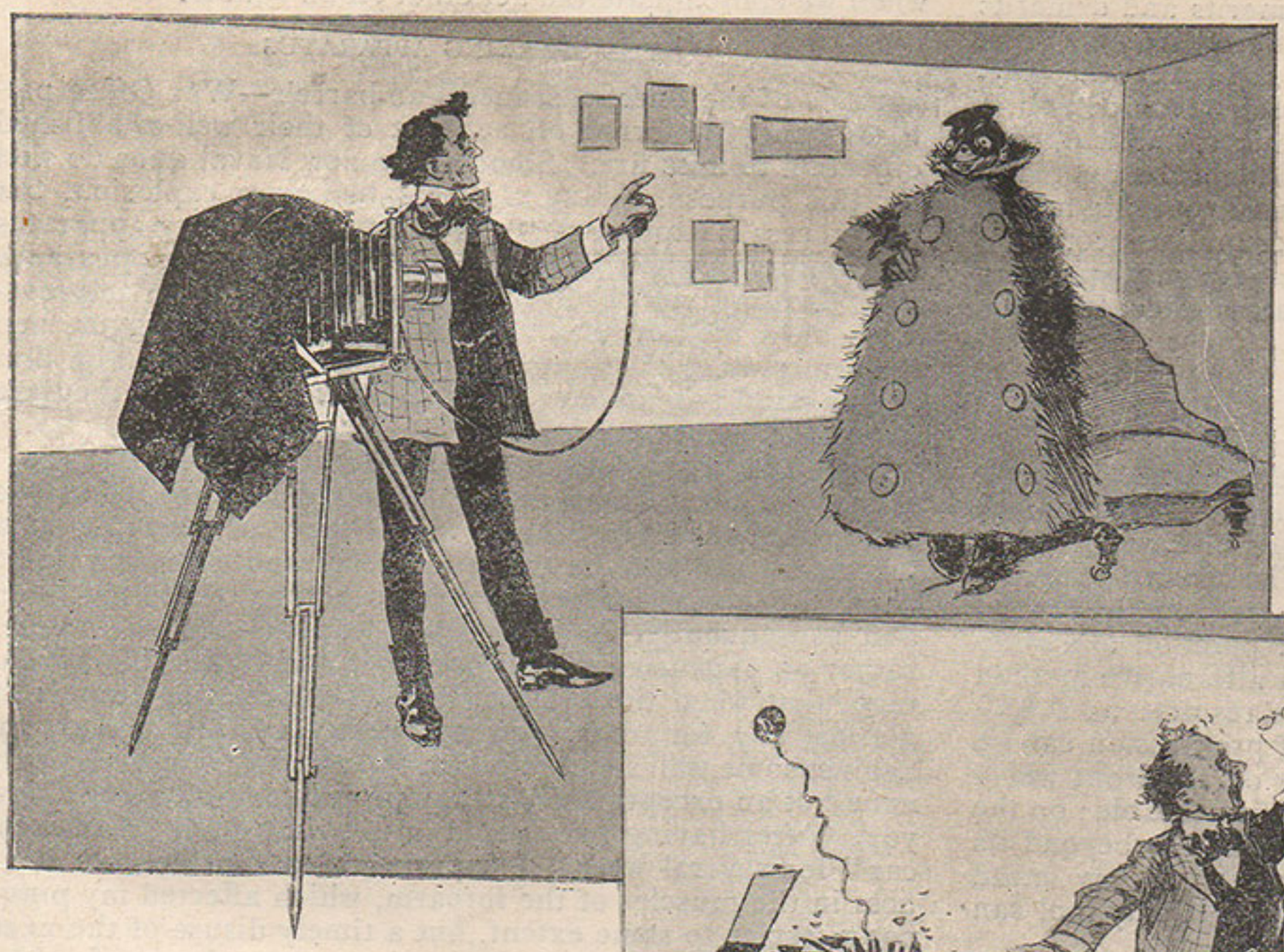
The De Dion Bicycle Motor, 1903.

It has been known for some time past that the De Dion Co. were putting a specially designed bicycle motor on the market, and a general description and illustration were given in No. of 20 "MOTOR CYCLING"; but the motor at that date was in a more or less experimental state, and since then the details have been considerably modified. We are now able to give our readers a complete description of the first motor of this type to arrive in England. This is now the fixed standard design, such as will be supplied in large quantities for the trade in January next. A comparison with the original design will show that it has been found necessary to re-adopt the radiators on the cylinder, and, moreover, these are carried the full length. This practice is noteworthy, applied as it is by one of the most experienced firms in motor making at a period when other makers are dispensing with part of the radiators. The arrangement of the exhaust valve and contact breaker by having it at right angles to the plane of the fly wheels is retained, but the contact maker itself has been re-designed, and is now on the positive make and break principle, instead of the De Dion trembler system. The width over the crank case is four inches, which enables the motor to be fitted within a narrow tread width. With the motor the De Dion Co. are supplying a carburetter, induction coil, and silencer.

THE CARBURETTER

is a very simple form of spray, with a float feed. Just above the float chamber is the mixing chamber, into which the inlet pipe from motor and warm air supply enter, and are controlled by a tap. The petrol, before passing through the valve, is filtered through a gauze filter. The silencer also has some special features: it consists of a tubular steel cylinder five inches long and two inches in diameter. This contains an interior tube and series of baffle plates fixed concentric with it. The exhaust gas enters by the central tube, which is plugged up a short distance down, and then the gases enter the outer chamber through a series of holes at one end of the centre tube, and thence are deflected against the baffle plates, and pass out into the atmosphere through holes in the other end of the centre tube. The induction coil is of the cylindrical type, in vulcanite case, 6¾ inches long, and 3 inches diameter. The motor is designed with a view to fitting on the main down tube of the bicycle.

[We had the New De Dion set specially photographed, but, owing to an accident, regret we are unable to give the illustrations this week. They will appear in our next.—ED.]



1.—POWER OF THE MOTOR COSTUME.

Motist: "Do your best, Professor, I want a particularly imposing photograph."

The next meeting between the motor spirit trade and the railway companies was arranged for Tuesday of this week.

An Eye to Business.

A youth was summoned at the Mistley Petty Sessions recently for riding a motor bicycle without a light, and was fined 2s. 6d. and costs for the offence. Defendant mentioned that the constable offered to sell him a lamp for 4s. 6d., "which," he added, "he didn't think was a constable's duty." P.C. Gardiner said he gave 3s. 6d. for the lamp, which was quite new, whereupon the Chairman remarked that he ought to be on his guard against selling lamps at a profit.

The Farman Automobile Agency will have about January, a new light car, to seat four persons; it will be fitted with a Centaure pattern engine, four cylinders, weighing only about 10 cwt., to sell at £350. It will be called the "Farman."

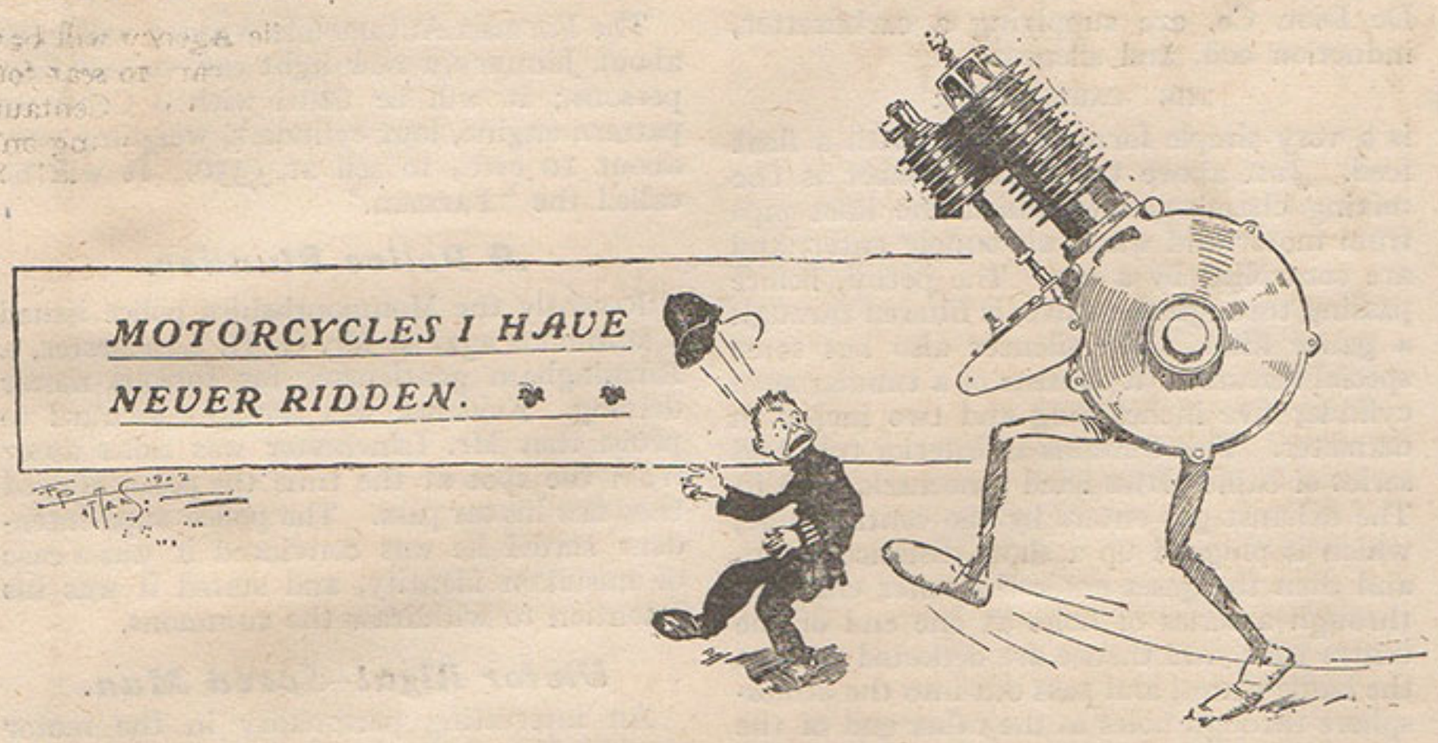
A Police Blunder.

Recently the Monmouthshire police issued a summons against Mr. G. H. Lanchester, a Birmingham gentleman, for furious motor driving. Evidence was brought forward to prove that Mr. Lanchester was miles away from the spot at the time the police alleged they saw his car pass. The police superintendent stated he was convinced it was a case of mistaken identity, and stated it was his intention to withdraw the summons.

Victor Rigal—Speed Man.

An interesting personality in the motor world is Victor Rigal, who is in the first flight of motorcycle speed men. In this number will be found an article from his pen, which should be studied with especial interest. Rigal took part in his first race in 1898, which he won, and since then, on a motorbicycle, he has won races and broken records galore. In the big Pau-Bayonne race of 1899, Rigal succeeded in beating Lemaitre on his big car. His next success was in placing the kilometre record at 57 secs. In 1900 a good start was made by the little rider, for he covered 100 kilometres in 90 minutes on the Etampes course at Chartres, breaking the hour record on the Crystal Palace track, covering 50 kilometres on the road in 36 minutes, and riding 71 kilometres 575 metres in the hour on the track, ere putting in his term of soldiering. In 1901 he was permitted to train for the Levassor prize for motorcycles, which he eventually won. After his soldiering, Rigal livened things up, twelve months ago, by winning the Gaillon hill climb, and shortly after reduced the record time on the hill to 42 secs. A little while later he reduced the kilometre record to 33 secs. In 1902 our subject started badly by a fall sustained at the Buffalo track, which laid him up for a time. Plymouth saw him in August, and later on at Deauville his kilometre time over the course was returned at 28 4-5ths secs.

2.– Photographer: "! ! !–! !—imposing photograph !–!—! Heavens, man, you've smashed the camera ! ! !"



Being invited by the editor of this journal to contribute a short article, it occurred to me that a few practical remarks about some of the motorcycles I have ridden might be useful; but I fancied that the idea when submitted was not received with the degree of warmth which I had a right to expect, and indeed on second thoughts I dismissed it from my own mind as savouring too much of a selfish or egotistical view of the question, and one which might conceivably give offence to that wide and worthy circle of my fellow-citizens known as "the trade." I determined, therefore, to limit my observations to a brief summary of the merits and demerits of certain motorcycles which I have not ridden; and I am more confirmed in this determination when I reflect that anything I may say in favour of any particular machine will, I have no doubt, prove acceptable to the maker, and will, with the publisher's consent, I have still less doubt, be quoted in the advertising, whereas anything of an unfavourable nature that, by reason of a more than usually scrupulous rectitude, I may be compelled to disclose, will lose—roughly speaking about one hundred per cent. of its damnatory effect from the consideration that it is

THE MOST FUTILE AND FOOLISH OF FICTION

as opposed to the solidest and soberest of fact.

The first motorcycle I decided not to ride was the "Ricketty Rickshaw," a motorcycle-cum-trailer invention, which has been ridden by most of the crowned heads of Europe, Asia, Africa, America, and Tudor Street. The motive power of this machine is a gutter-perky press, acted on by several highly-independent forces from behind: palm-oil and common or oliefiant gas are employed as an alternative method of pushing this machine with excellent results: as a hill-climber it is full of merit, and its rate of progression can be calculated by the puffs; the attachment on the front wheel hub for the horse is particularly neat and serviceable; on the straight its performances would not, I fancy, go beyond its promises, but, at the time, when I made up my mind not to try it, it was going downhill, and—well, any fool can run it down.

THE RICKETTY RICKSHAW

is not an expensive machine, a consideration which, in those days of baronial beef and prohibitive coal, is worth taking into account. Four-pence three-farthings a day is all they ask for it, and as it is guaranteed to last for twenty-four hours, the purchaser gets full value every time.

Having been initiated into the elements of not riding, I launched out into the deeper water of the sport, and procured the prospectus of the "Badger Motorcycling and Perfumery Company," whose Model A, known more popularly as the "Ozoniphi," I found to be a most suitable machine for the non-rider. Like many of the other products of the Badger Co., the "Ozoniphi" rejoices in a potent perfume: its strength lies in its smell: in other respects it is weak, but as it only professes to be made for the weak, and to be let out by the week, one ought not to consider this a drawback.

A good feature of this machine is the accumulator, which catches any evanescent odour which has a tendency to roam to the footpath, and retains it for the subsequent benefit of the hanger-on: the sum total of the "hum" accruing from this storage principle is calculated to stagger non-motoring humanity, outdoing as it does the triple extract of sulphuretted-hydrogen, or the accumulated fragrance of many foxes: indeed, if as seems probable the ancient sport of foxhunting decays through local opposition and lack of horses, an Ozoniphi cross-country trial would make an excellent substitute.

The "Lixion" is a motorcycle which deserves notice, if only for the peculiarity of its construction. This unique little machine is built on an entirely new principle, wood and rubber taking the place of steel or iron throughout, except in the motor apparatus, which is of gun-metal. The frame of the "Lixion" is made from the wood of forest-grown trees, preferably hoax (except for the steering pillar, which it is found more advantageous to construct of elm). The bearing parts are of rubber, a resilient material which obviates the grinding action so apparent in metallic bearings when insufficiently lubricated: indeed, the "Lixion" does away with the necessity of lubrication altogether, a comforting reflection when we contemplate the action of oil on rubber.

THE SPARKING APPARATUS

is made of the finest seasoned gun-barrels—War Office patterns being preferred on account of their well-established objection to miss fire. Some of the new Naval guns do well for this purpose, giving a very satisfactory explosion, but the process is expensive, as for a small generating apparatus one requires a whole battery. In spite of its frail appearance the "Lixion," which, as its name suggests, is an improvement on a metallic machine, is a sturdy little jigger, and with fairplay, will last its lifetime. The makers claim that it will stand any amount of hard knocks, provided they are not given below the belt.

The man who wants a fast motorcycle, a real "russia," should get the "Kamskatcar," so-called because it has two cams, neither of which has a cat's chance of engaging with the other, and may be taken to pieces and conveyed home by car if necessary. The "Kamskatcar" is a cooled machine, and consequently, in the present state of the coal trade, rather an expensive one to keep up; but it has this advantage, that when the fuel begins to fail and you despair of getting any for'arder, you are pretty certain to run up against some wall's end or other, the temporary use of which none but an exceptionally stingy proprietor would begrudge you. After having persevered in not riding the "Kamskatcar" for several weeks, I experienced a considerable stiffness in the muscles of the forearm, which affected my ping-pong service to some extent, but a timely disuse of the next little machine, which I shall mention, restored me to health, and gave me back my wonted command over the celluloid sphere.

THE "SILENS" MOTOR,

a machine of the "ex-horsed" type, is a marvellous specimen of motorcycling workmanship, of which we can say nothing truer, or more appreciative, than that it has already delighted and amazed two great continents. It was invented in America and made in Germany. The unique feature of this machine is the quadruple-tank-and-cylinder-action, which enables it to fulfil a fourfold purpose. Thus it may be used as a bicycle by day, a lawn-mower after office hours, a watchdog at night, and an alarum clock in the early dawn. The purchaser of a "Silens" motor generally feels that he is conferring a benefit upon his neighbours at the same time that he is laying up a store of pleasure and excitement for himself. A dropped-frame variety, which will do good work as a sewing-machine, will shortly be put on the market.

Stanley Show Stand 84.

Don't fail to inspect the many good features of the "Ormonde" Motor Bicycles and the "Kelecom" Motors, they embody more real and practical improvements (which have been thoroughly tested during the whole of the past season) than any of their competitors for public favour. After you have visited our Stand at the above Exhibition you will agree with us that the ensuing season will undoubtedly prove to be

An "Ormonde" AND "Kelecom" Year

The following are a few of the many good points of the 1903 models.

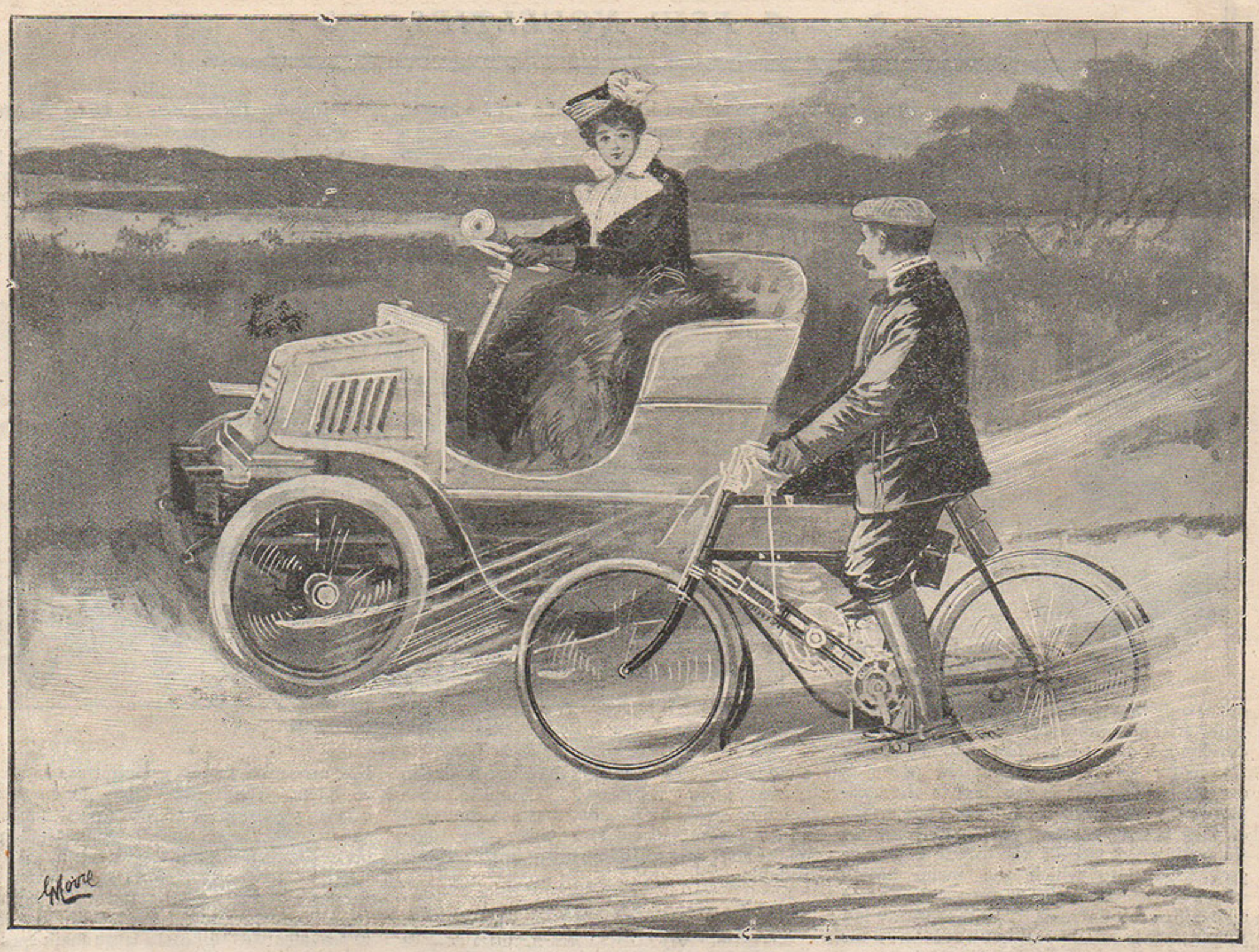
An entirely new system of exhaust valve opener and current breaker.
Automatic oil feed greatly improved and adjustment of feed simplified.
Petrol reservoir now has a dial indicating exact quantity of petrol.
Oil reservoir is fitted with a glass gauge showing quantity of oil.
The valves and exhaust port are much larger proportionately than hitherto.
The fly-wheels have been considerably increased in size and weight.

Preliminary Pamphlet ready upon opening date of the Show.

The Ormonde Motor Company,

Wells Street, Oxford Street, LONDON, W.

C27



SHE KNEW!

***He** (testing her knowledge of motors of which she has been boasting): "What would you do if you had a bad short circuit?"*
***She** (promptly): "Why, I should go a longer way round to avoid it, of course."*

An additional advantage of this machine is that it is fitted with a "make-and-break-contract," whereby the dealer binds himself, if you break one part, to make you another for double the money.

I will complete this necessarily incomplete treatise with a short dissertation upon the "Petrollycus Paterfamiliaris," or family motorcycle, which has lately been devised to meet a large and growing demand. Of this invention it may truly be said that no suburban family should be without one. The great difficulty with the family man has always been his inability to share his sports and amusements with his wife and offspring. The trailer-attachment of the ordinary motorcycle, or the bicycle proper, is well enough for a honeymoon trip, or for the young Benedict whose hostages to fortune do not run into double figures, but the bread-winner of a mother of thirteen stone and fourteen children may well hesitate before offering to take the family out for a ride; he feels the difficulty of the situation as it were. Now this difficulty the "Petrollycus Paterfamiliaris" meets: it is made in several patterns, and can be geared to any family. The stock size has accommodation for twelve persons. Papa sits over the front wheel, and mamma balances him on the back one, thus furnishing a serviceable buffer against the irresponsible motorcar, and providing a suitable surface for affixing a clip-bracket to hold a rear light. Augustus, in the vacation, straddles the top tube, and looks after the mixing, steering, swearing, and other technicalities; whilst Maud has place of honour on the saddle, with her nether limbs gracefully disposed and draped in suitable S-shaped clips affixed to the top tube. Tertius, Alexandrina, Victoria, Albert Edward, Motorina, and little Septimus are hung on pegs, in order of merit, to various parts of the machine, each peg being provided with a rubber insulator as

A PROTECTION AGAINST ACCIDENTAL ELECTROCUTION:

thus nine members of the family are accommodated with outside seats, and three infants can be comfortably packed away in the petrol reservoir. The only blemish on the fair fame of the "Petrollycus Paterfamiliaris" is that no provision has been made for the family dog—an ungrateful acknowledgment of his great interest in the progressive movement of the motorcycle.

In conclusion, I would strongly recommend this form of motorcycling to my readers as an easy, cheap and convenient recreation, costing nothing in license fees, and requiring no special outfit if we except, of course, the necessary "carberretta," or motorcycling cap, which is generally worn, and can be obtained from cycling-outfitters in a variety of art shades.

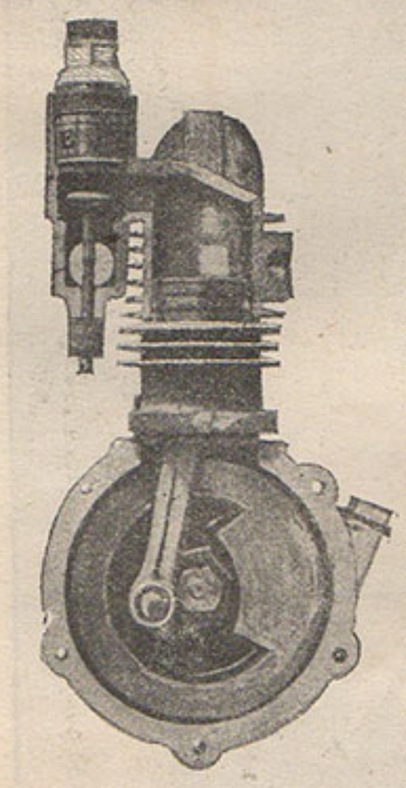
SAXON BROWNE.

C 29

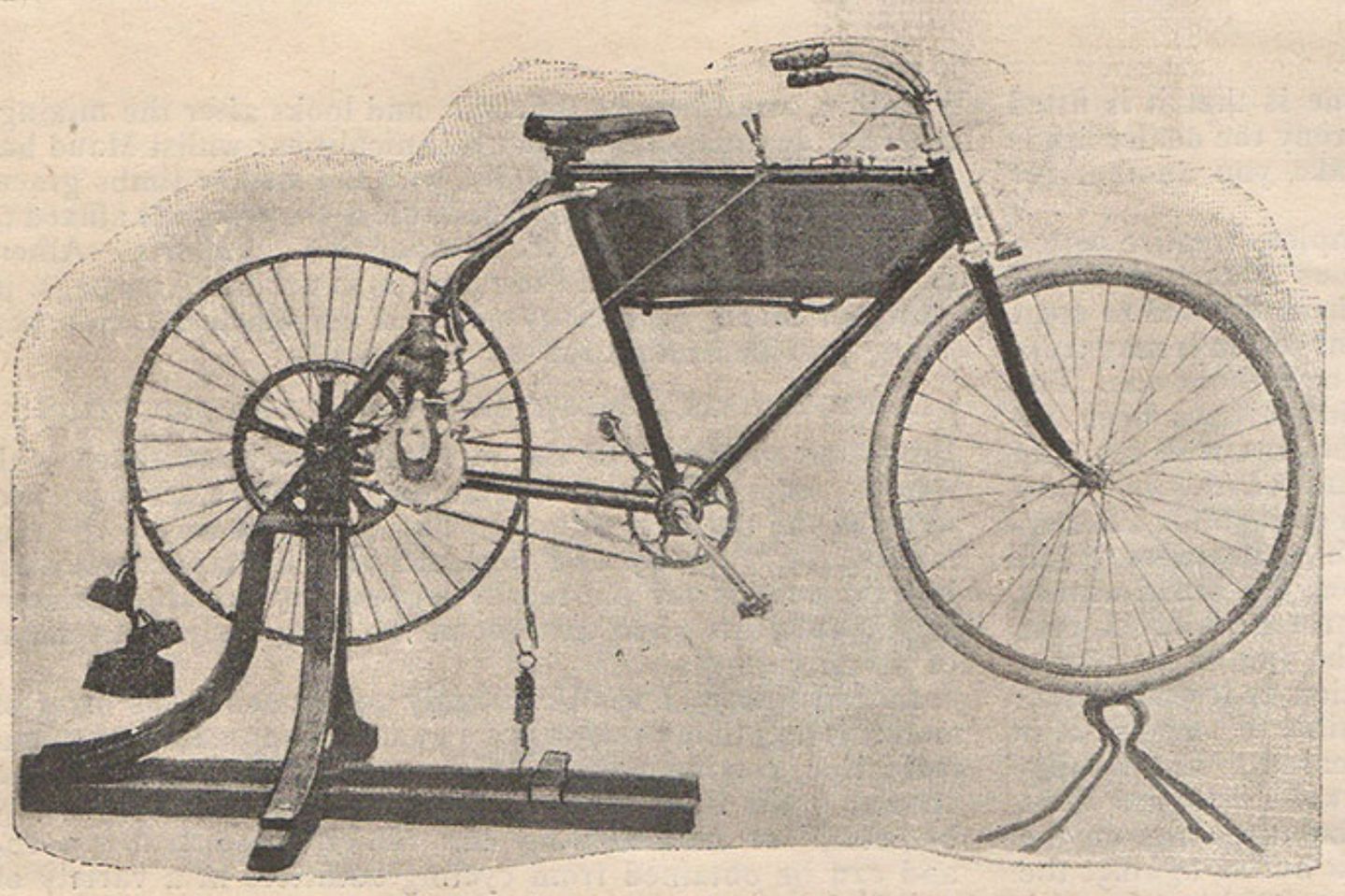
A FEW NOVELTIES.

A Unique Design of Motor-bicycle and Scientific Test of Same.

The machine illustrated is a French production and made by Georgia Knap, of Troyes, France. It is remarkably light and simple in construction, and is probably the smallest and lightest motor on the market. The bore and stroke of the cylinder is 45 mm. by 45 mm.; just a shade over 1¾ inches, and the maximum speed 2,400 revolutions per minute. The cylinder is in one piece with the combustion chamber. It has interior fly wheels and the weight of the motor alone comes out at only 14½ lbs. The compression is specially high. At its maximum speed this little motor will develop just over 1 h.p. The method of fixing the motor and transmitting the power is distinctly novel. It is attached to the compression stays and back forks by means of lugs brazed to the tubes. Mounted on the back wheel axle of the bicycle is a large gear wheel into which the motor pinion wheel gears. The drive is thus a direct one and minus belt or chain. The carburetter is a simple surface pattern and ignition is by means of a small coil and accumulator, and lubrication is effected by means of a gravity feed.



There is one lever for advancing the spark and opening the exhaust, and another for the throttle valve. From the illustration it will be observed that the machine is mounted up for a power test by means of a dynamometer. This is a very simple apparatus, consisting of a cord, adjustable weights, and a spring balance. The rear rim has its tyre removed and the cord is passed round it. Then, by a well-known formula, it is possible to calculate the horse-power developed by the little motor with great accuracy. It is claimed that the complete fittings can be readily detached from the frame when necessary. Complete, the machine scales 62 lbs., and has accomplished 35 kilometres —equal to 21 miles—per hour on the level, and will climb hills 1 in 17 without pedalling.



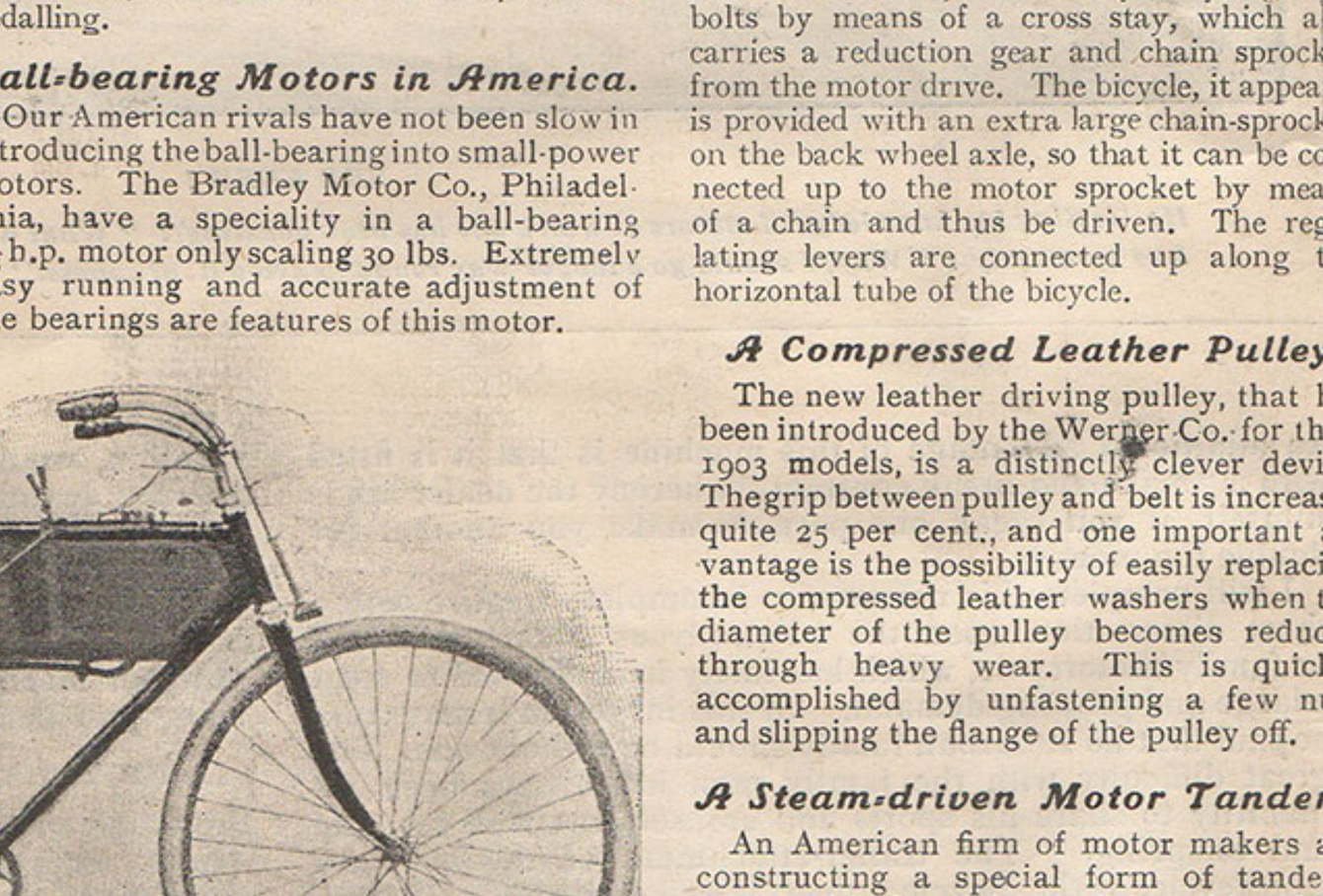
Method of testing brake horse-power.

Ball-bearing Motors in America.

Our American rivals have not been slow in introducing the ball-bearing into small-power motors. The Bradley Motor Co., Philadelphia, have a speciality in a ball-bearing 2½ h.p. motor only scaling 30 lbs. Extremely easy running and accurate adjustment of the bearings are features of this motor.

Bicycle to Convert into Motor.

This is an American idea of doubtful value, it would seem, but interesting from the point of distinct novelty. The idea is to have an attachment that will quickly convert an ordinary bicycle into a motor vehicle. To do this, the inventor uses a rear frame carrying an entire motor mechanism, consisting of a 2½ h.p. air-cooled motor, carburetter, and tanks complete. The frame consists of a single tube carrying two pivotted or hinged forks for the two wheels, and this attachment is clamped on to the rear stays of the bicycle by lugs and bolts by means of a cross stay, which also carries a reduction gear and chain sprocket from the motor drive. The bicycle, it appears, is provided with an extra large chain-sprocket on the back wheel axle, so that it can be connected up to the motor sprocket by means of a chain and thus be driven. The regulating levers are connected up along the horizontal tube of the bicycle.



A Convertible Bicycle

A Compressed Leather Pulley.

The new leather driving pulley, that has been introduced by the Werner Co. for their 1903 models, is a distinctly clever device. The grip between pulley and belt is increased quite 25 per cent., and one important advantage is the possibility of easily replacing the compressed leather washers when the diameter of the pulley becomes reduced through heavy wear. This is quickly accomplished by unfastening a few nuts and slipping the flange of the pulley off.

A Steam-driven Motor Tandem.

An American firm of motor makers are constructing a special form of tandem, presumably for racing and record-breaking purposes, to the order of the Brothers Murphy, one of whom, it will be remembered, made a mile a minute bicycle record, paced by an express locomotive. The motor is of 5 h.p., and steam is generated in two multi-tubular boilers heated by petrol burners. In preparation for a speed event on this machine the Brothers Murphy are having a special riding suit made, and also a breathing apparatus of special design. The riders anticipate to do a mile in 40 seconds.

STEAM AND .. .. .. ELECTRICITY.

Their Possibilities as . . Motive Power for Cycles.

By "Magneto."

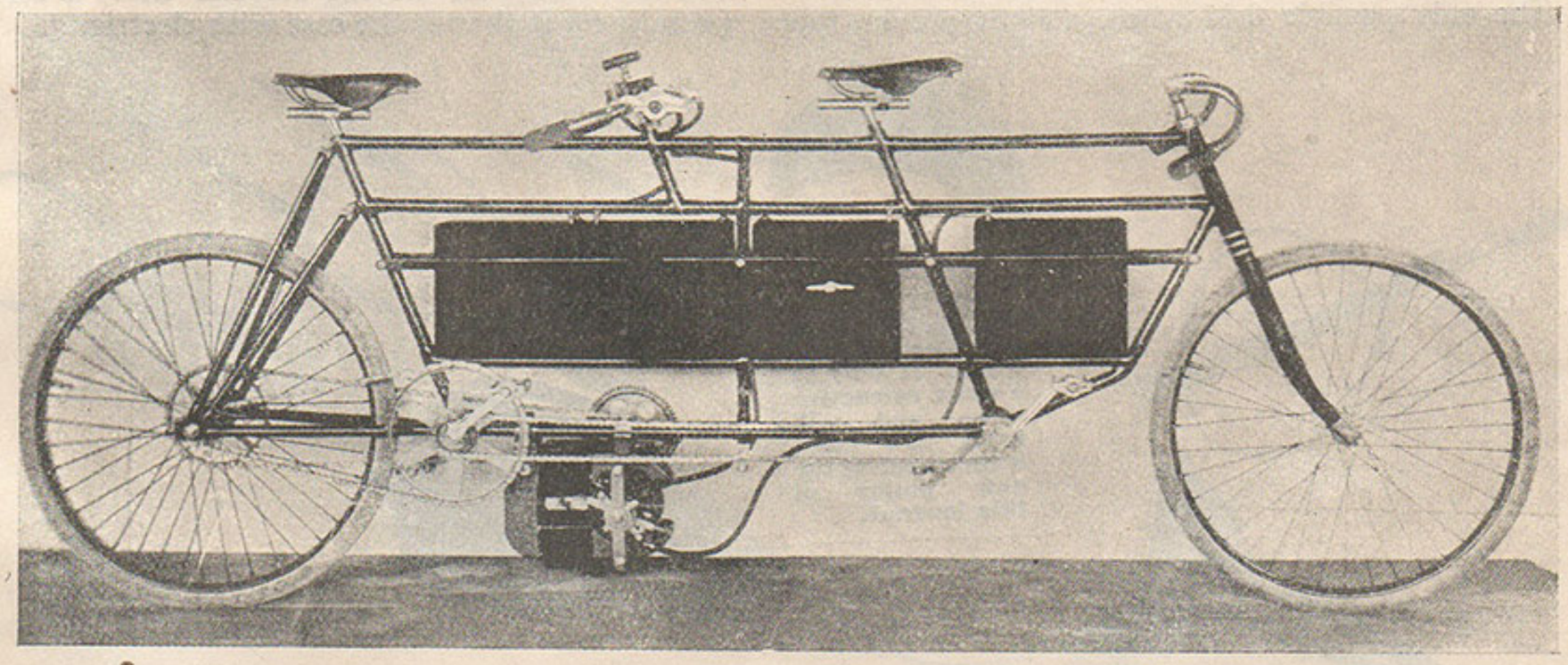
We live in an age of electricity. The uses to which this mystic and invisible force adapts itself are numerous beyond record, and yet who is there bold enough to define the limits of its possibilities? But the motor enthusiast will say that the day of the successful electrically-propelled car or cycle is not at hand, and is not likely to be for many a long day. Yet the petrol car owes much of its success and safety to the application of the electrical system of ignition—without the tiny electric spark to fire the charge the finest and most powerful car is inert and lifeless. But why cannot we utilise the electric current to run our cars, when it has proved such an ideal system to run our trams and trains? It is the scope of this article to deal with the problem in as interesting and explicit a manner as possible, and show that the problem is not beyond solution. Let us go back to one of the opening years of the 19th century and we find the first record of the application of electricity as a motor power. On the River Neva, in Russia, it is recorded that a Professor Jacobi ran a "small boat with a magnetic motor supplied with an electric current." The little vessel, it is said, attained a speed of nine miles per hour.

THE PRINCIPLE OF THE MAGNETO ELECTRIC ENGINE

was established, but, strange to say, for many years it was only regarded as applicable to scientific curiosities and toys, and little research on the subject was attempted. Meanwhile, during the years 1830 to 1840, the famous English electrician and experimenter, Faraday, had discovered the principle of the dynamo machine, which converts mechanical power into electrical power; but it is to the renowned French engineer and electrician, M. Gramme, that the discovery of the reversibility of the dynamo into a motor when supplied with electrical power is due. The record of this discovery is an interesting one. Gramme, it is said, had several of his dynamos at the Vienna Electrical Exhibition of 1873, and one day he observed that the cables had, as he thought, become detached from one of the machines which was not running. He thereupon connected the cables up to the terminals and was astonished to find that the dynamo began to revolve at a great speed on its own account and turn the engine, which was supposed to drive it, backwards. Here, then, is the key to the principle upon which our electric trams and trains are worked, and that is—that if we take two identical dynamo machines, and get one to generate electricity by driving it from a steam or gas engine, if we send the current into the other dynamo it will at once convert *the electricity back into mechanical power and run as a motor*. Therefore, all electric motors are dynamos reversed. It is pretty general knowledge that the great majority of electric trams and trains do not carry their own supply of electrical energy, but have the supply generated at a central station or depot, and then carried along bare conductors which run parallel with the lines, the car taking the current as it runs along by means of a trolley arm and wheel contact. But it is more with the self-contained electrically driven car that we have to deal with in this article. The question is this: Is it possible for a car to carry its own supply of electrical power? The answer is Yes; but there are limitations to the system at present. The advantages of electrical motive power compared with petrol or steam are great. Thus,

THE ELECTRIC MOTOR RUNS NOISELESSLY AT ANY SPEED.

and is devoid of smell, heat, smoke or fumes; is not liable to take fire or explode, and has great elasticity or range of power application. Self-contained cars have been made and have achieved some measure of success as short distance vehicles, but up to the present time the accumulator has been the only possible means of carrying the electrical power. The motor itself, with its remarkably effective and simple means of power regulation, is well-nigh perfect, but, most unfortunately, grave limitations are imposed by the enormous dead weight that has to be carried in the shape of the lead plate storage



The 1899 Humber Electric Tandem, driven by accumulators and 1 h.p. electric motor. Said to have achieved a speed of 40 miles per hour on the track.

batteries. Weight cannot be moved without the expenditure of power, therefore half the effective power of the car is lost in moving the dead weight of the batteries. Another drawback is that a large amount of valuable space is taken up by the batteries—ten times as much, in fact, as is taken up by a supply of petrol that would suffice to run a similar power car an equal distance. Our hope for light electrical traction in the future lies in the possibilities that some genius will discover some material other than lead—alas! aluminium cannot be used—that will enable a storage battery one-fourth the weight of a lead one to be constructed. But it would even be possible to look further ahead than this. Accumulators, we know, supply electrical power second-hand, as it were. They have to be charged from a dynamo which generates electricity from mechanical power. We can get the current first-hand by chemical means of dissolving a metal like zinc in certain acids; but this is an expensive metal. But eminent men of science do not ignore the possibility that some day we shall

BE ABLE TO GET OUR CURRENT DIRECT FROM COAL

instead of the present roundabout way. It comes from the coal, nowadays, by having to burn it in the furnace of a steam boiler, and drive an engine and dynamo. The field for research in this direction is great, and it is to be hoped that attempts will be vigorously prosecuted to get a light and efficient primary generator of current. One of the great advantages that would accrue from the perfecting of an electrically-driven vehicle would be the entire dispensing with complicated and expensive speed-changing gears. The mechanism of an electric car is simplicity itself, and there is nothing to go wrong even in the hands of the inexperienced. Concerning the application of electricity purely as a motive power for cycles, there is nothing satisfactory in this line likely to develop for some years. It is interesting to look back upon what has previously been attempted. Eighteen or twenty years ago a

MOTOR-TRICYCLE DRIVEN BY STORAGE BATTERIES WAS DESIGNED

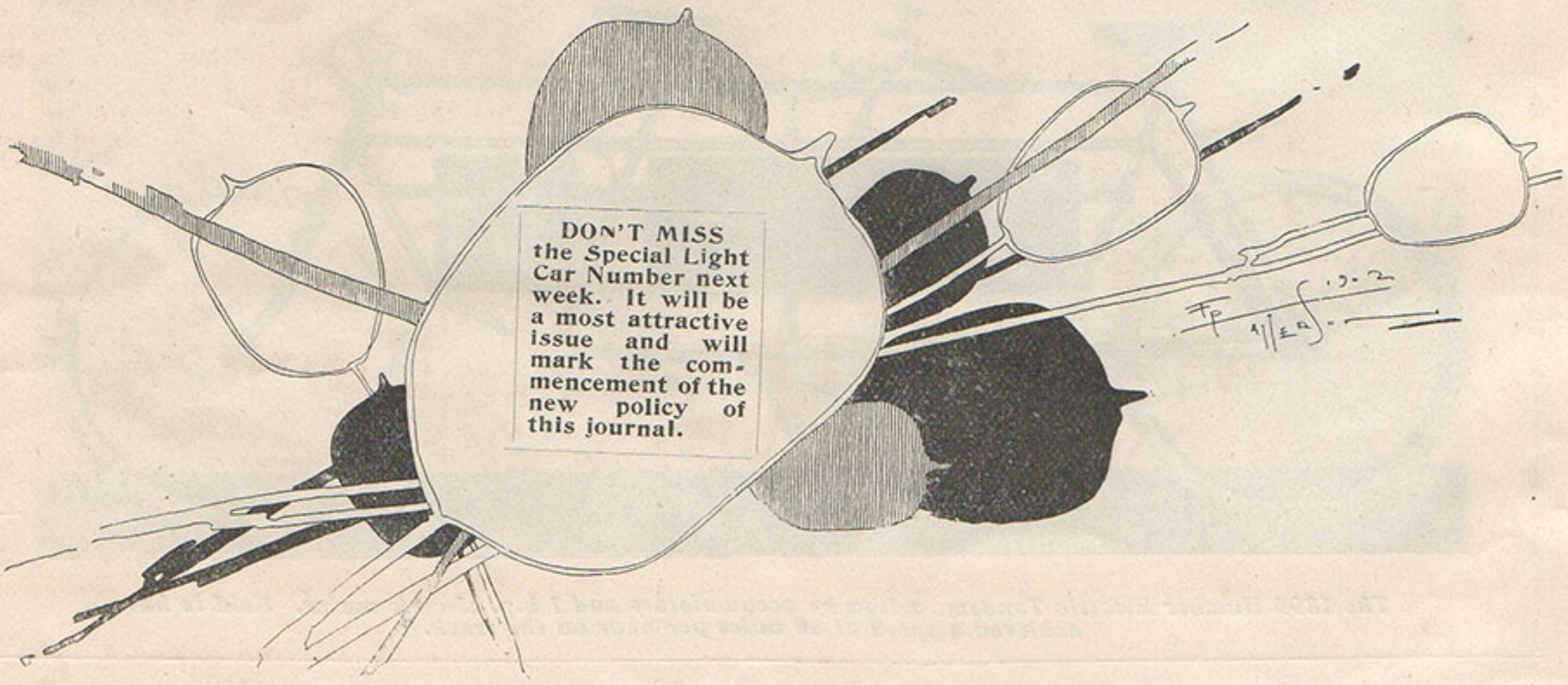
by Professors Ayrton and Perry, of London. It was a curious and cumbrous device, with large diameter, solid tyred wheels, and large boxes of accumulators. The motors—there were two—drove direct through gear wheels. The weight of the machine was tremendous, and it must have been a most uncomfortable mount to ride on rough paving. Whether or not the machine was capable of beating the then legal limit of four miles per hour is not recorded. As might have been expected, the machine was fitted with brilliant electric lamps, run from the accumulators. Within quite recent times (about '98 or '99 cycling seasons) electrically-driven pacing tandems were used on some of the London tracks, but the introduction of the petrol-driven machines displaced them and little has been heard of them since. No doubt by adopting some of the improved accumulators now on the market a really fast electric pacing machine could be designed, but its range would necessarily be limited to rather short distances, as the power would be used up so quickly The only possible field where a light present-type storage battery might be employed would be in the construction of a tricycle suitable for short runs up to 50 miles or so, but even here it would have only a limited application, as the necessary recharging would be a great drawback.

STEAM AND ITS APPLICATIONS.

Steam as a motive power for cars and cycles was in use long before the petrol motor was ever dreamt of. Seventy years ago steam-driven motorcars were running successfully in the streets of London, and the steam-driven velocipede was the favourite line of the mechanical inventor of the forties and fifties, as a look through some of the old volumes of the "Mechanics' Magazine" of those days will show. Steam, like electricity, has its limitations of application, although not to anything like the same extent We see steam-driven cars of the light variety being driven successfully to-day, and one can fairly ask the question whether or not it is likely to supersede petrol as a motive power. To answer this question we shall first have to investigate the principles and conditions upon which the steam car works. In all cars we have a type of boiler and furnace generating steam at a very high pressure. The heat to raise the steam is provided by either a paraffin or petrol burner. The steam at high pressure is made to drive a pair of small double-acting engines, which drive direct on to the driving axle of the car by a chain. The elasticity of steam power is such that it is possible to run direct without the interposition of a change-speed gear, and in this respect it resembles electric power, but a supply of water and fuel, which must necessarily be limited in quantity to suit the capacity of the car, has to be carried. In several of the usual type of steam cars met with, the steam is generated in what is termed a multitubular boiler, which is one fitted with a great number of small tubes, through which the heat circulates. Another type of generator is known as the "flash" boiler, such as adopted on the "Meisse," "Serpollet" and "White" steam cars. In this system the steam is raised in a steel tube, which is kept at a high temperature—the water being injected into the tubes at intervals by means of a force pump and immediately flashed into steam at high pressure. The exhaust steam in all good types is condensed so that no cloud of steam is visible from the car.

STEAM, BESIDES BEING SO VERY ELASTIC IN ITS RANGE OF POWER,

has the advantage of being vibrationless, noiseless and odourless. The construction of the steam engine is also simpler in many respects than the internal combustion engine. The steam car, undoubtedly, has a big future before it, but the range of distance these cars can travel at present, on a given amount of fuel and water, is limited. Improvements must take the direction of obtaining greater travelling capacity without increasing the weight of the car appreciably. Considerable care is also required in managing the boiler, as there is always a danger present of burnt or leaky tubes in the hands of the inexperienced or careless. With regard to the application of steam power for driving bicycles there is certainly greater promise for it than is the case with electricity.



OTHER PEOPLE'S VIEWS.

An Explanation.

Sir,—Re letter of "H.G." (Rugby) on page 231 "MOTOR CYCLING," query 3, the "little pool" referred to is probably condensed moisture from the atmosphere, due to coldness of carburetter. When working, test it by saturating a piece of worsted in it and apply a light. I have similar experience with a Mitchell.—Yours faithfully,

"TEUF-TEUF."

Running Motor with Benzoline.

Sir,—We have had our attention called to the Hon. Leopold Canning's letter in your last issue, and should be glad it you would kindly publish the following remarks. We may say that running a motor with benzoline and ether is no new venture, we having had to resort to the same aid on many occasions. We must also take exception to the Hon. Leopold Canning's remarks that the wick variety carburetter is the Century Motor Co.'s own patent; inasmuch as the patent was invented by Mr. R. Jackson, and jointly owned by himself and Mr. A. Firth, the former being now connected with the Eagle Engineering and Motor Co., Ltd., Altrincham. The Century people use this carburetter under licence, but at the present time it is known as the "Eagle" patent surface wick carburetter, and is fitted to our well-known Eagle tandems. We will thank you to kindly insert these remarks in your next publication and oblige.—Yours faithfully,

THE EAGLE ENGINEERING AND MOTOR CO. F.A.C.

One-piece Cylinder and Combustion Head.

Sir,—Your correspondent, "Geo. Webster," in comparing the merits and demerits of the one-piece cylinder and combustion head, has, I am afraid, only heard the story which now, for some reason or other, is being told everywhere, and it would be interesting to know where it originated. It certainly appears absurd to any one having handled air-cooled motors to read that, first the combustion head becomes red-hot, etc. *What would an air-cooled motor do at all, once the combustion head was allowed to become red-hot?* It is useless to discuss which part would become hot, next, for the simple reason that if the motor continued to go at all, it would soon be ruined, and to consider what would happen to an engine under circumstances in which it should never be at work is equal to thinking what would happen to the various types of boilers if the fire were well made up and the water allowed to run too low. The further little bit of education, that the asbestos and copper washer between the two faces makes all the difference also is wide of the mark, for the reason that *the copper touches both faces as well as both sides of the washer touching each other*, and a better heat conductor than copper is hard to find. The strangest of it all is that the very same thing has been told me in many different quarters, and as there is no reason in the argument, and, consequently, little truth, it makes one wonder where it started.—Yours faithfully,

J. VAN HOOYDONK.

"Motor Cycling" as an Aid to Amateur Motor Building.

Sir,—I have taken in "MOTOR CYCLING" from the beginning, and may say have learned a great deal from it. I have recently built up a bicycle motor from a set of castings, and I have, through the help of "MOTOR CYCLING," got it to go, even at an extremely slow speed by itself, without any belt on it, for five minutes on an angle-plate fixed to the floor, without overheating in any way. It answers readily to the advance of the sparking, and never misses fire at high speed. I am in hopes of fitting it to a bicycle of the same "make." I can recommend the set of castings to any amateur like myself, who is thinking of building a motor.—Yours faithfully,

Newich House, Cheltenham College, Cheltenham. E. W. FITZ-HERBERT.

Motor Cycling in India.

Sir,—I shall probably be proceeding to India shortly, and am anxious to continue motor cycling. One man tells me he has used petrol in America, with a temperature of 110° and found it no impediment, but I saw in an article of one of the motoring papers that no one would think of using petrol in a tropical climate. If not, why not?

The Burma and Assam Co. say they will supply petrol in India, but at what price?

Can any of our correspondents tell me anything about the use of alcohol for driving motorcycles, and what is likely to be the best form of carburetter? I should think there would be no difficulty in getting alcohol manufactured cheaply enough, if only the duty on its sale were not prohibitive. As it stands at present, the risk of taking out even a £50 motorcycle seems rather too great, but if a few of these points could be cleared up, there is no doubt that there is a great field for an enterprising firm who would take up motoring in India, as the roads in many places are excellent and extensive, and at places, like Secunderabad and Bangalore, there would be a good many who would use motors of some kind or other.

Information from any of your correspondents who have local knowledge on these subjects would be of great interest. Also whether water-cooling is a necessity, and whether anything in the way of a wet or even dry felt cover for top and sides of petrol tank and engine would be practicable or desirable.—Yours faithfully,

London, S.W. "BITTEN."

DON'T MISS IT.

The Special Light Car issue of "Motor Cycling" is in active preparation, and will be published on Tuesday next, December 2nd. It will contain a fund of useful information regarding the movement towards providing light and simple pleasure cars at what may be called popular prices. The Special Issue will mark a distinct departure in the policy of this journal, and no reader should miss getting it.

The Best Form of Light Car.

Sir,—You invite opinions from your readers of the best forms of light car. Recently you published a photograph of Van Hooydonk and Ilsley on a tandem. Another bicycle was in front of Ilsley. It appeared, with a little imagination, as if Ilsley was sitting in a comfortable seat (with perhaps room for two), driving the motor in front of him. If such a tricycle-car were made, I venture to think that it would be a huge success. The driving would, I suppose, be something like the Humber tricycle, with a chain on the rear axle, free engine, of about 5 h.p. Advantages: (1) comfortable seat, (2) get-at-able motor, (3) simplicity, (4) cheapness, (5) 15s. licence.—Yours faithfully,

Kingswear, Enfield. G. C. GRIMSDALE.

Magneto v. Electric Ignition on Motor Cycles.

Sir,—I have been reading your fine little book, "Motor Cycling Manual," and note that the number of spare parts one has to carry when he has the battery and coil system of electric ignition, such as a sparking plug, two tremblers, two platinum tipped screws, a voltmeter, india-rubber insulating tape, a quantity of insulated wire, etc., and why people have this method of "electric ignition," and have to carry all these spare parts about with them, when they can have "magneto ignition," which appears to me to give no trouble of any sort, is a mystery. I never have to carry any spare parts for the ignition gear, and "misfires" are practically unknown. Can any of our readers explain to me why it is not universally adopted on all motor-bicycles? I am not one who rides a machine for a 100 miles, and because that gives no trouble, say it is perfect, but I have used both methods of electric ignition, over 3,000 miles or thereabouts. With the "battery and coil" system I have had some trouble, but with "magneto ignition" I have had practically none. Trusting this letter is not too long.—Yours faithfully,

ST. JOHN C. NIXON.

[Our correspondent must remember that the high tension system is from a mechanical point of view far simpler than the magneto, and it is not easily possible to adapt the magneto system to the standard design of a small power motor. The magneto sparking plug is a very complex affair, compared with the high tension plug, and then we have the driving gear, which is subject to high speed, and liable to wear and consequent derangement, unless particularly well made. Then the power to drive the magneto has to be supplied from the energy of the motor. Nevertheless, with even these disadvantages, the magneto system works remarkably well, but it would be folly to assume that it is going to supplant the high tension system. As evidence of this it is worth noting that a large proportion of motorcycles for next year will be fitted with the high tension coil and accumulator system of ignition.—ED.]

OUR ACTIVE POLICE FORCE.

Light or Heavy Weights?

Sir,—I regret exceedingly that "Petrolia" in your last week's issue should have written so persuasively on the question of weight reduction in motorcycles. It is an able article, but I cannot help thinking it will prove a veritable red herring trailed across the track of motor progress. This is not the direction in which we motor-cyclists should be trained to look for further progress. What is the saving of a few pounds in the weight of a machine compared with getting an engine which never goes wrong, a carburetter which never fails, a plug which never fouls, or an inexhaustible accumulator? A few extra pounds in weight is the very smallest problem which affects the motor world! An extra millimetre in the bore of the cylinder overcomes this, but a faulty carburetter, and uncertain sparking are such vital matters that any authoritative article which draws away attention from these things is, I consider, to be deplored rather than commended. Manufacturers are already advertising machines especially light, so that if a breakdown occurs the machine can be easily pedalled home. Fancy a carriage-builder claiming for his recently-designed dogcart that if the horse goes wrong the driver can easily push it home himself! The one possibility which should never be contemplated is that of having to pedal home a broken-down motor-bike. The causes of such should be tackled and eliminated before the question of weight is allowed any place whatever in the discussion of motor problems. Hence my sorrow at a capable writer like "Petrolia" using his influence in a direction calculated to put manufacturers and motor-cyclists on the wrong track. Feather-weight bicycles only came after the question of ball-bearings, pentagonal frames, and pneumatic tyres had been settled. Even now the feather-weight bicycle is mainly the machine of the feather-brained scorcher, who wants a new machine every year. Weight, with all its drawbacks, is the natural ally of safety, and the evolution of the locomotive and the railway carriage have usually been accompanied by a marked increase in weight. Where man himself is the motor, as in the ordinary bicycle, weight is an important factor; but where petrol does the work the weight of the machine is the last thing to be considered. Give us a machine which sparks at the first revolution of the pedals and no one will grumble if it weighs a couple of hundredweights; but give us another which requires humoring for the first mile, misfires half its time, and eventually has to be pedalled home, the fact that it may only weigh 60 lbs. does not make us blaspheme the less. The ignominy of pushing a machine whose business is to push you is just the same, whether the machine be light or heavy.

Hence it is that the one little paragraph in the "Hunting Man's Experience," by Edward Kennard, J.P., dealing with the Simms-Bosch magneto ignition is, I consider, of vastly more importance to the motor-cyclist than the plea of "Petrolia" for a lighter machine.—Yours faithfully,

W. T. Eltringham.

Jesmond, The Mount, Shrewsbury.

A Point for Advertisers of Second-hand Machines.

Sir,—As a constant reader of your valuable paper, might I point out that it would be an advantage if gentlemen having motor-bicycles for disposal would state the size of the frame so as to avoid needless enquiries? I notice that in last week's "Motor Cycling" only one instance occurs in which the size of the frame is stated. As an intending purchaser, I enquired about a machine advertised last week, only to find that it was unsuitable as to size. Time and trouble would be saved if this point were attended to.—Yours faithfully,

Ashford. A. F. Brereton.

Re Possible Infringements of the Phœnix "Trimo."

Sir,—In the issue of November 12th Mr. R. J. Maddock describes a front attachment which he hopes to have ready about Christmas. This, as you are no doubt aware, is nothing more or less than the Phœnix "Trimo," an attachment which has now been ridden hundreds of miles, including the run to Oxford on Saturday, and described in all motor and cycling journals, including our "own" "Motor Cycling." It is, of course, quite probable that Mr. Maddock should have thought of the idea without having seen the "Trimo's" description or illustration; at the same time as the design has been registered by me, the making and using of a similar attachment becomes an infringement, an act of which, I feel certain, Mr. Maddock does not wish to be guilty. The "Trimo" will be exhibited at the Stanley Show, when Mr. Maddock will have an opportunity of examining the actual device.—Yours faithfully,

J. van Hooydonk.

On Everyone's Tongue

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REX

1903 Specialities.

The REX Patent Silencer.
„ REX Registered Design.
REX 2¾ h.p. Motor.
BRITISH-MADE REX.
VIBRATIONLESS REX.
HILL-CLIMBING REX.

(Guaranteed Speed 18 miles per hour up 1 in 9 gradients.)

"King of Motor Bicycles."

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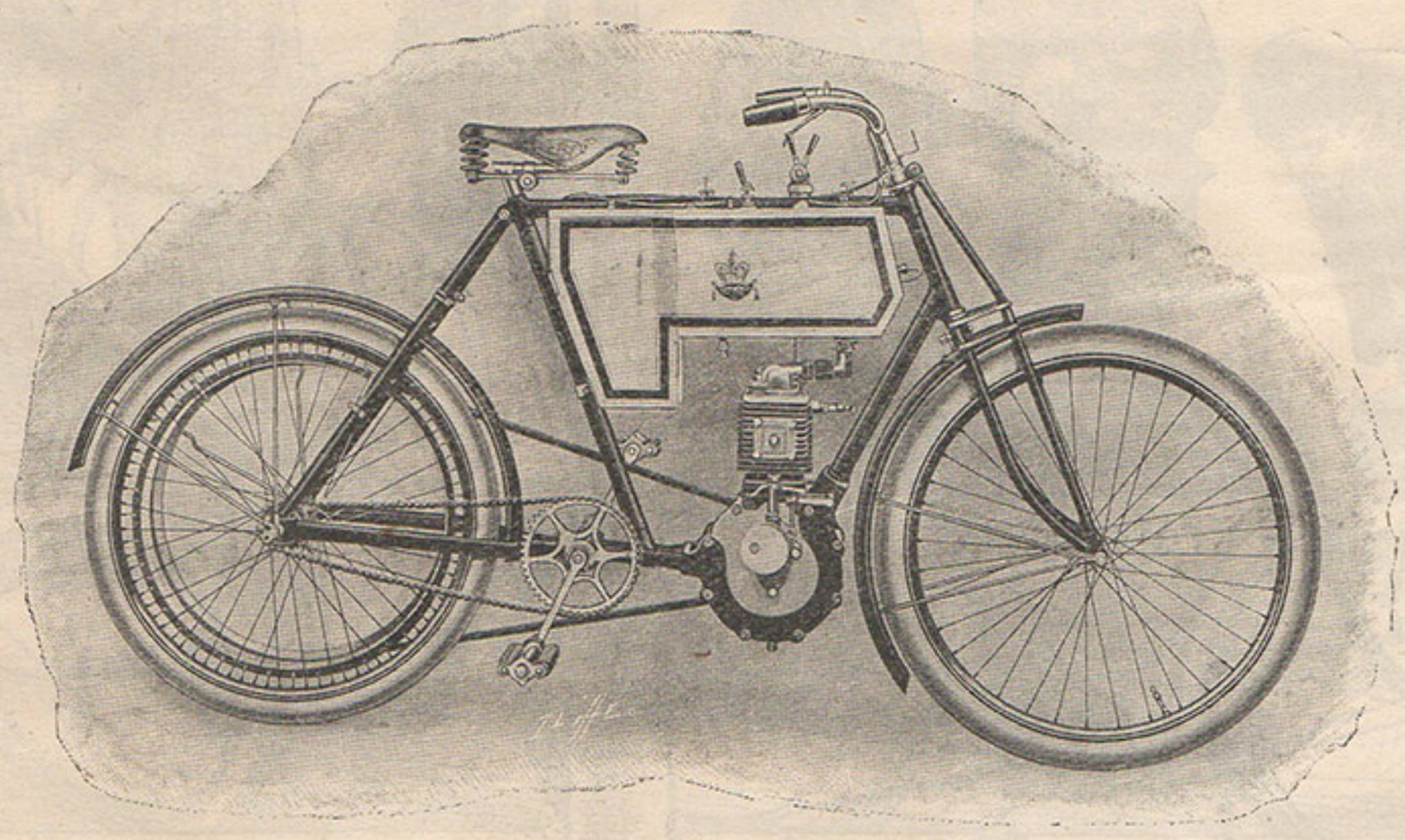

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12 REX Motor Bicycles on view at National Show, Crystal Palace, Nov. 22–29.

Stands Nos. **55 & 56.**

REX OUTPUT

800 Bicycles a Year;

311 Orders already Booked.

The Rex Motor Mfg. Co., Ltd., COVENTRY.

OUR INFORMATION BUREAU.

A large number of replies have been dealt with through the post. Information on all subjects pertaining to Motors, Motorcycles, and Motoring generally will be given to readers who seek such information or advice. Any reader who desires to ask a question with a view to 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 if of general interest; if not, a reply will be sent by post; a stamp, therefore, must always be enclosed.

H.M. Shackell.—We do not advise you to take proceedings, unless you are prepared to run the risk of losing. It is impossible to say what, in such circumstances, the decision of a Court would be.

'Ware Cheap Motor Sets.

"Reader" (Sydenham) asks us if we can recommend him to invest in a De Dion pattern motor set that he names costing £13 complete; also would Warwick roadster tyres be quite suitable for light motorcycle?—The set "Reader" mentions we have heard complaints about, and we know it is not possible to produce a thoroughly reliable set at the price. A better combination of tyres would be roadster on front wheel and tandem tyre on back wheel. Roadster tyres could be used for both, but back one would get cut up rather quickly.

Altering Quadricycle.

J.D.W. (Shepherd's Bush) is thinking of converting a quad in the following manner:—By fixing two 2½ h.p. De Dion motors side by side; couple together and drive by belt or chain to rear axle. How much would a Crypto gear cost giving three speeds and reverse? Do we advise free engines and clutch?—We cannot recommend the fitting of two separate engines coupled together. Far better get a single 4½ h.p. De Dion, and drive by gearing through a Dupont two-speed gear. This also gives a free engine. The Crypto gear would, no doubt, have to be specially constructed, and we could not give an estimate of the cost.

2¾ h.p. Motor that Stops on Hills.

C.B. (Burnley) has a 2¾ h.p. machine of known make. It is immensely fast on the level, but has no power on hills. He notes a peculiar tapping noise when engine is slowing on a gradient; also when the machine has been travelling at good speed and is suddenly switched off, on switching on the spark again there is always a loud bang—why is this?—An engine of this power ought to take any hill unless geared abnormally high. Impossible to say what the noise is due to; the gudgeon or crank pin *might* be loose, but hardly probable, and it may only be the tapping of inlet valve, which is nothing. It seems to us that there is something wrong with the carburation, and engine overheats. Try running on weak mixture, and retard spark on hills. The cause of back firing on exhaust was fully explained recently in "MOTOR CYCLING" Hints and Wrinkles.

"Motorist"—A copy of the guarantee would have been useful to us in answering your question. We think, however, the makers are liable to replace the defective piston.

Carburetter Improvement.

E.W.W. (Perry Barr) has a 2 h.p. Rex with spray carburetter and asks would it be an advantage to run a bye-pass from exhaust valve to warm the spray chamber during cold weather? If so, which would be the best method to adopt to fit it.—"E.W.W." should arrange so that air inlet to carburetter is close up to the cylinder—like in the F.N. motor-bicycle—and he would find this a distinct advantage. We do not recommend injecting part of the exhaust into the spray chamber, as it gives a bad mixture.

Concerning De Dion Motor and Coil.

L.B. (Westcombe Park) has bought a De Dion voiturette, the engine of which is not in running order. He wishes to know how to set the timing correctly, and also how to connect up the coil. There are only two low tension terminals, one marked M and the other P.—To set the timing gear look up full particulars (by "Motor Repair Man") in recent back issues of "MOTOR CYCLING." Connect the M terminal to frame of machine and P—Pile—to positive terminal of accumulator and, of course, the other single terminal, being the high tension, will go direct to the sparking-plug.

Belt Problems.

"Caution" (Wandsworth) writes:—"I am having trouble with belt on my new Werner; it slips horribly. The first belt supplied with the machine soon went; a raw hide lasted longer, and now I have one of double thickness riveted together, but without much improvement. Coming home to-day, in the wet, the engine started racing every time I let it go; this although I continually tightened belt. You gave me such a good tip re valve lifter that I think you could help me in this. Would you advise me to have a Lincona belt, new pulley and driving rim (I presume I could do this), or can you suggest any other way not so expensive? I see in your issue to-day a new pulley (Lycett's) which strikes one as being good, supposing the Lincona was used."—We should not recommend altering the present pulleys; it would not be easily done and would be too expensive compatible with results. The flat belt drive is mechanically the best, but the presence of wet slush on the pulleys and belt face is very detrimental to the grip. On the whole, the Werner drive is a very good one, and we can only suggest that "Caution" should keep his belt in a thoroughly pliable and adhesive condition, and then it will run slack and drive well; but if he has much riding to do on wet roads, it will be imperative for him to rig up a leather guard of some kind to keep the slush off the pulley and belt face, as it cannot possibly drive wet; the wet surface reduces the grip 40 per cent.

"Badly Packed"—(We are sorry our legal contributor omitted to note the initials of the sender of this enquiry.—ED.)—The goods being badly packed, the senders are liable. Write them a letter threatening County Court proceedings, if you do not hear from them within seven days.

Concerning Shape of Piston Rings.

J.E.H. (Glasgow) asks for information concerning the shape of piston rings; thus, should they be an even thickness all round, or thicker at the ends near the slot, as he has been examining some rings recently and he could not get two alike?—The best shape for the piston ring is for it to be of a maximum thickness at a point opposite the slot and tapering to within some distance of the ends. This is necessary to give the ring sufficient spring, as they are made out of fine-grained cast iron.

Balancing the Parts.

"Centaur" (Manchester) is building up a motor from a set of castings, and would be glad if we would explain the reason for balancing the fly wheel.—The idea is to balance the centrifugal force of the connecting rod end and crank, and also balance as far as possible the weight of the piston. If these parts are not balanced, the vibration would become very excessive, increasing with the speed. The inertia of the connecting rod and piston have to be compensated for by the energy stored up in the fly wheel—that is to say, the motion of the piston and connecting has to be stopped suddenly, and reversed at every revolution.

Oil on Inlet Valve Mystery.

H.S.M. (Truro) writes:—"Thanks very much for your recent advice about the silencer, which I am acting upon. There is one point about my motorcycle on which I should very much like your advice, and that is oil getting past the inlet valve and some way up the pipe to the carburetter. After every ride I have to take out the inlet valve and clean it with petrol or else it sticks. I have tried oiling the machine less often, gradually increasing the distance, but I found the 2 to 1 gear ran dry. I have tried new valves and stronger springs; also Lucas's oil, "D" oil, and Bayliss and Thomas's oil, without improvement. The machine is a 2¾ h.p. Excelsior. The piston rings are perfect; I always wash the cylinder with paraffin every day, and the compression is perfect. I have never had oil on the sparking-plug, which always keeps perfectly clean, so that the presence of oil some four inches along the inlet pipe is a mystery.—It is hardly possible for any oil to get drawn with the gas unless some has got into the petrol tank and is carried in with the vapour, and it must get past the piston somehow; probably with too frequent oiling. It is not necessary to take out valve if a small hole be drilled close up in the inlet pipe so that petrol can be injected. This hole should have a small spring cover fitted to it. Most valves require freeing after standing for any length of time.

Recommend the Quadrant.

E.G.W. (Bedford Park, W.) is about to invest in a motor-bicycle, and writes:—"I know practically nothing about motor bicycles beyond the fact that I am going to get one. Will you be good enough to advise me on the subject? I want one that will pull a trailer at a moderate speed—simplicity of mechanism essential. Capacity of tank for about 120 mile journey; price not much over £50. Wanted for comfortable riding, up to 25 miles an hour—not for high speeds. Do you think a Quadrant would suit?"—We should say that the Quadrant would suit admirably. The control is very simple and effective, and power ample.

Exhaust Tube Redhot.

R.E.W. (Barnet) was recently testing his 1½ h.p. motor-bicycle on the stand, and was alarmed to find that the exhaust pipe became red hot in three minutes. He immediately stopped the motor, and is anxious to know whether he is likely to have injured the motor in any way, and if a red-hot exhaust box and tube is likely to occur when running the machine on the road.—No injury is likely to result, but it is never advisable to run a motor long enough for the exhaust to get red hot. It very rarely occurs on the road, for the reason that the draught of air created keeps the heat from accumulating. When run stationary there is no draught, of course, and the exhaust pipe soon gets redhot.

Firing in Exhaust.

"Embryo-Motist" (Manchester) has recently invested in a motor-bicycle, and has observed when running at night that now and again there is a peculiar blue flame, which appears to come from around the exhaust valve. This is accompanied generally by a sharp report, and motor slows up temporarily. This occurs more frequently on a rough road than on smooth paving. What is the cause and remedy for this?—As a rule, this is due to a misfire in the cylinder. This unexploded charge gets into the exhaust pipe and silencer, and it is fired by the next ignited charge. If the nut over the exhaust pipe is not screwed down tight the flame will get through. The remedy is to readjust the contact breaker and clean the platinums. E.M. is also probably running with too strong a mixture, which gets further upset on rough roads and misses fire.

Concerning the Trembler.

A.W. (Hyson Green) is in trouble and writes as follows:—"I have got a front driving Werner, old pattern, and find there is only a very faint spark at the trembler. I have tried all the wires and they seem all right, and light the lamp brightly. The machine will run, but fires very irregularly for a short time, and then stops. I have tried a fresh trembler and also a fresh platinum screw and a fresh sparking.plug. I can get a good spark at the wire terminals, but not at the trembler. Any information would oblige very much."—You do not want a strong spark at the trembler contacts. Be certain your accumulator is connected up all right + to + of coil, and the points of sparking-plug not more than 1-32nd inch apart. Set the contact blade to vibrate immediately it drops into the cam slot. If the motor does not fire regularly now, you may be pretty certain that it is the carburetter that is not acting properly. Look up back numbers of "Motor Cycling" for a lot of valuable tips how to make the carburetter efficient.

A20

Wants a Good Set of Castings.

H.J. (Sandicroft) is about to fit a motor to his Sunbeam roadster bicycle, and would be glad to know who would supply a really good set of castings partly machined.—We hear good accounts of the castings supplied by the Dorman Engineering Co. (as advertise in "Motor Cycling"), and recommend "H.J." to get a set, and at the same time send full particulars of machine dimensions.

Coal Gas Gives Less Power.

R.F.L. (Oldham) has just finished a 1½ h.p. motor, but has no carburetter. Would it be possible to run motor just to test it with ordinary coal gas through a temporary mixing valve?—It is quite possible to run motor with coal gas, but it will give out much less power than with petrol. What we recommend "R.F.L." to do is to rig up a simple surface carburetter out of a tin box and a piece of lead or brass tubing. If he looks up articles on carburetters, he will see how to apply the principle.

Detail Dimensions, etc.

W.T. (Crewe) is building a motor-bicycle, and would like to ask a few questions concerning it. (1) What power will be given by engine of following sizes: 2⅞ in. × 2¾ in. stroke, one fly wheel 12 in. diameter, with 1½ in. × 1½ in. rim, at 1,500 to 2,000 revolutions a minute. Inlet valve 1⅛ in., exhaust 1⅛ in., both operated mechanically? (2) Gear ratio—size of pulleys to use Lincona belt. (3) Amount of compression space (valves in top of cylinder). (4) Width at top, depth and angle of pulley to take Lincona belt.—(1) This engine should develop 2 h.p. easily. (2) A 7 to 1 ratio would be most suitable for road work. (3) Leave ¾ in. for compression. (4) Best to write for particulars to the Lincona belt people.

Mechanical and Electrical Problems.

W.A.G.. (Pilton), in an appreciative letter *re* the value of "Motor Cycling," asks our assistance on the following points: (1) How can the power of a 2¼ h.p. tricycle be economically increased? (2) Has had an E.I.C. plug in use for some months with very satisfactory results, but on a recent run motor stopped, and on trying spark it was strong to the frame, but not visible at the spark plug points. Replaced with another plug, and motor started up again. but after two days spark disappeared again, this time from high tension wire. Accumulator showed 3½ volts when it had recently been recharged. What is the cause of all this? (3) Can he make a Fuller bichromate charging battery? (4) Do we publish an index at the end of each volume?—(1) It is possible, by increasing the cylinder dimensions and compression, to get rather more power, but we should recommend the fitting of a two-speed gear as the best way out of the difficulty. It will be necessary to get a really experienced engineer to fit it. (2) It appears that the insulation of the plug has broken down in the first instance. At the same time, it looks as though the accumulator was either not properly charged or had run down on open circuit, due to an internal defect. When charged, the cells should show 4.4 volts—that is, providing the voltmeter is accurate. Get an electrician to have a look at the battery and instrument. (3) It is quite possible to make a Fuller bichromate charging battery, and thus be independent of incompetent motor people. It was clearly described in No. 2 "Motor Cycling," but the United Motor Industries supply an excellent set ready for use. (4) Yes, index Vol. I. is ready.

Machine in Hot Climate.

A.C.P. writes:—"I have an Ormonde 2¼ h.p. motor-bicycle, and should like to take it out to Australia next January. Will the heat, when going over, damage the tyres or accumulator? If so, would you tell me how to prevent any damage being done?"—Machine will be quite safe if it is carefully crated, tyres thoroughly inflated, and accumulator left fully charged and disconnected from circuit. Also coat bright parts with vaseline, and empty out the petrol and oil tanks.

Faulty Magneto Ignition.

T. (Greenwich) has a magneto machine to ignite his motor, but cannot get a spark in the combustion chamber But on disconnecting the wire from plug, and touching any part of the motor whilst turning it round, he gets a good spark. Also, having broken a tooth in the large gear wheel, will it do to fit two pins in place of the tooth?—There is evidently a short circuit on some part of the sparking plug. The insulation must be carefully examined, and new mica washers put on. It is not clear what gear wheel "T." refers to, but it would be possible to get a new tooth put in by a first-class repairer; but if it is a small two to one pinion, should recommend a new wheel.

Re-boring Motor Cylinder.

R.J. (London, N.E.) writes: "I have an engine to following measurements—bore 62 mm., stroke 71 mm., fly wheels (usual double kind in crank case) 6 ins., inlet valve 1 3-16th in., exhaust valve 1¼ in., walls of cylinder 4½ mm. thick. Can you please tell me (1) can the cylinder be safely re-bored to 68 mm., leaving the wall 1½ mm. thick? (2) If not, to what extent can it be safely re-bored? (3) What would be the probable increase of power gained thereby? (4) Can you tell me who would undertake such an alteration?"—It would not be safe to re-bore cylinder more than 65 mm. Increase of power very small—about 1-12th h.p. Better to increase the compression. Look up the advertisements for motor builders.

Concerning the Three-wheeled Car.

"Peregrinator" (Birmingham) writes: "The illustration and description you give this week on page 204 of a simple three-wheeled car is extremely interesting, and I am sure further particulars would be of great value to a number of readers. Could you obtain a few more details as to construction of frame, what size of tube and gauge, and whether stayed vertically? Back of body is apparently carried by an elliptical spring—how is the front mounted? The speeds are stated to be worked by moving the steering lever. That appears a little mixed or incomplete—how is it done? Some authorities hold that 2¼ h.p. is too little for a small car. Is any data available as to actual speed and hill climbing power? What is the total weight of car, and what size of tyre is used? This car is just the thing that very many people want—inexpensive, economical in use and of good appearance."—The machine our correspondent enquires about is a German production, concerning which we have no further details; but there is likely to be important developments in cars of this class very shortly, and we advise our readers to look out for our special light car issue on December 2nd for full details.

STAND No. 53.

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Entirely - British - Made - Motors

The D.E.C. MOTOR, 2 h.p. and 2¼ h.p., AIR COOLED.
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We shall be pleased for intending Purchasers to try our **"WHIRLWIND" MOTOR CYCLE** in the PALACE GROUNDS.

THE DORMAN ENGINEERING CO.,
Contractors to H.M. War Office. **NORTHAMPTON.**

NATIONAL SHOW.

SEE OUR STAND AT THE NATIONAL SHOW.

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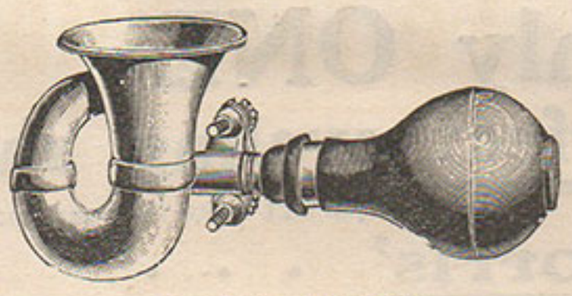
Cleans Greasy Belts,
Post free, *1/9.*



MOTOR HORNS.
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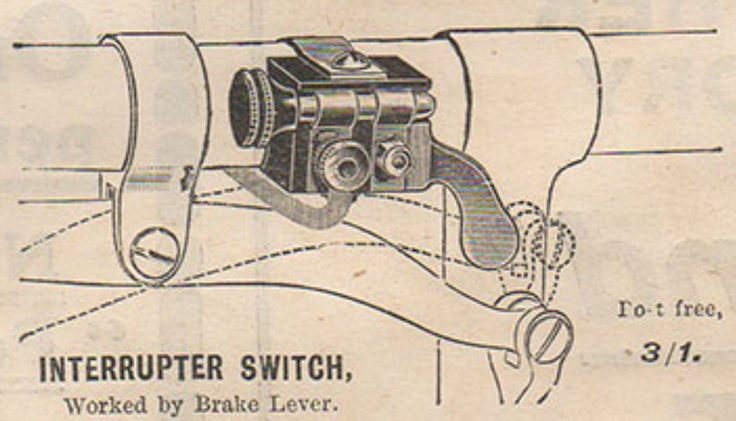

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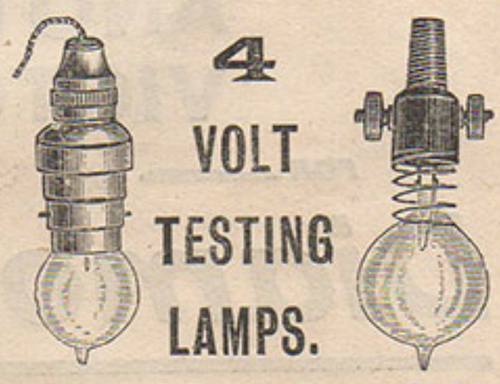

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6½ in. high x 4⅜ in. x 2⅛ in.

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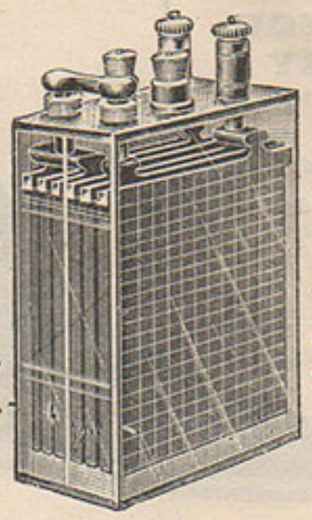

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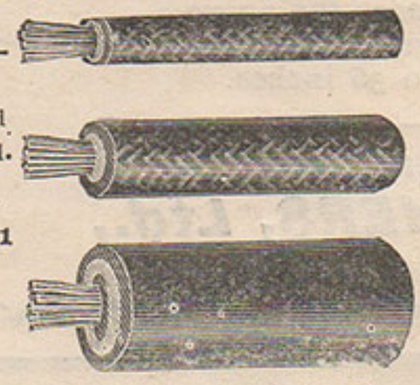

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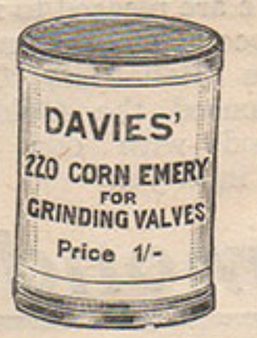

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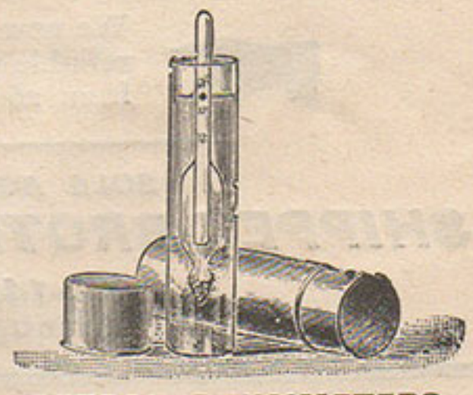

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A23

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Telegrams: "Pressimus, London."
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REMITTANCES.—Postal Orders, cheques, etc., should be crossed and made payable to "Temple Press, Limited."

COMMUNICATIONS.—All letters regarding subscriptions, advertisements, and other business matters must be addressed to "The Manager."

EDITORIAL.—All Editorial Communications and copy must be addressed to "The Editor," and must reach him not later than first post Saturday morning. If stamps are enclosed with drawings or MSS. which are not considered suitable, same will be returned, but the Editor does not hold himself responsible for the safe keeping or safe return of anything submitted for his consideration.

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ADVERTISEMENTS.

All instructions and matter for general trade advertisements must reach this office by Wednesday Morning, First Post, to ensure insertion in the following Tuesday's issue.

Advertisements of Motor Cycles, Cars, Accessories, Sundries, etc., from private sellers and buyers, are inserted in the "Sale and Exchange" Columns at the rate of

20 WORDS FOR 1/- (Minimum)

and One Halfpenny for each additional Word.

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and One Halfpenny for each additional Word, with 10 per cent. discount for series of 26, and 20 per cent. for 52 insertions. Cash with order.

Advertisements for "Sale and Exchange" can be received at the offices up to the First Post on Thursday Morning, and must be prepaid in every case.

The object of the "Sale and Exchange" columns is to assist private persons in procuring or disposing of motorcycles, cars, accessories, or other articles of personal property. Business or Trade Advertisements are accepted, but are classed as such in their respective divisions. Persons inserting trade advertisements as private are liable for the difference in rate of 1d. and ½d. per word respectively.

In the interests of our readers, we shall not hesitate to take proceedings against any persons in the trade who succeed in obtaining their advertisements published as "Private," and shall insist to the utmost upon the payment of all law costs incurred.

DEPOSIT SYSTEM.—For the convenience and security of our readers, we have decided to institute a deposit system. The intending buyer forwards to our office the amount of the purchase money (notes or money order save time) which will be acknowledged to both parties. If a sale is concluded, we forward to the seller the amount agreed upon. If no sale is made we return the amount deposited. In either case we deduct a commission of 1¼ per cent. (3d. in the £, minimum 1s.), on the amount deposited, to cover our expenses of booking, postages, etc.

Carriage is to be paid by the buyer. If the article is returned, each party pays one way. The risk of damage in transit is the seller's. Articles on approval are not to be retained more than three days unless by arrangement between the parties. All disputes to be settled by the arbitration of the Editor of "Motor Cycling."

DISPLAYED ADVERTISEMENTS

of all kinds are inserted in this Section at 7/6 per inch, single column. Terms for a series or for larger spaces on application.

All communications respecting "Advertisements," must be addressed to "The Manager," "Motor Cycling," 7—15, Rosebery Avenue, London, E.C.

Motor-Bicycles.

(20 words 1/- First post Thursday.)

SPLENDID bargain, brand new Mansfield motorcycle, Minerva engine, 1¾ h.p., exhaust lifter, spare tank, Clincher A Won motor tyres, £37. Jones, 54, New City Road, Plaistow. 791a

ORMONDE, 1¾ h.p., ridden 100 miles, perfect condition, special belt, £35; monthly payments taken. Apply, Musgrove, Leadenhall House, E.C. 80.a

ORMONDE Special, 2¼ h.p., ridden 150 miles, perfect condition, Lincona belt, £38, monthly payments taken. Apply, S., 4, Roughdown, Boxmoor. 814a

WERNER, 1901, front driver, guaranteed perfect condition, ridden 800 miles, Clinchers, Bowden, exhaust lever, Bowden brake, £27. Blewett, Chemist, Hayle. 824

1902 PHŒNIX, spring seat, lamp, watch, cyclometer, stand, spare parts, perfect condition, £30. Pinibrick, Kensington Infirmary, Marloes Road. 826a

ROYAL ENFIELD, new last March, and now in perfect running order, ridden only 600 miles, engine 1¾ h.p., long belt drive, weight 110 lbs., splendid hill climber, price, including spare valves, springs, belt, trembler, and screw, etc., £50, (maker's price £50). To be seen at Lycett and Co., cycle agents, Lee Green, S.E., where trial can be arranged, or write owner, E. Perman, 7-15, Rosebery Avenue, London, E.C. zzz

QUADRANT, new, 1½ h.p. motor-bicycle, all latest improvements, single lever, etc., etc., Clincher tyres (never punctured), Brooks' special saddle, machine new end of February, and in splendid condition, complete with tools, spare parts, etc., £32 (maker's price £48 cash); will be sent on "Motor Cycling" Deposit System. Oldbury, Rectory Road, Sutton Coldfield, near Birmingham. 694zzz

MINERVA, 1½, nearly new, gold lined, extra finish, fast machine, horn, lamp, tools, two rim brakes, £32. Motor spirit, accumulators charged. Special facilities for repairs, conversion. James Robertson, Cross Street, Sale, Manchester. 775b

LATEST Ormonde, 1903, vulcanised Dunlops, latest improvements, E.T.C. plug, special accumulator, coil, Lincona belt, complete set spares, motor bag, horn, lamp, perfect condition. Write offers, 44, Rosenthal Road, Catford. 879a

H. N. MOTOR-BICYCLE, perfect order, practically new, good hill climber, very fast on level, trial, £30, or near offer. B., 6, Madeira Road, Streatham. 892a

SINGER motorcycle, 1902, spare tank, practically new, perfect condition, cost £70, price £47 10s., trial allowed. Lawrence, 35, Brompton Road, London. 894a

ORMONDE, 1¾ h.p., motor-bicycle, Lincona belt, nearly new, in perfect order, £27 10s. Harper, 34, Chesterton Road, Cambridge. 896a

EXCELSIOR, specially built to order, genuine 2¾ b.h.p. motor, flat Lincona belt, self-sealing tubes, unpunctured, scarcely marked, spare valves, trembler, plugs, and screws, also a spare tank and stand combined, quite equal to new, not ridden 500 miles, Werner first prize, holder of Scotch record five miles, extra fast and powerful machine, climb any hill, any trial allowed, Lucas motor gas lamp, horn, two brakes, goggles, and everything, cost £70, take £55, buying car sole reason for sale. Frank C. Dorman, 573-581, Gallowgate, Glasgow. 898a

EXCELSIOR motorcycle, new last July, ridden 200 miles, cost £50, price £31, no offers. 188, Coltman Street, Hull. 899a

BARGAIN, Rothwell motor-bicycle, good as new, not run 900 miles, latest 1¾ h.p. Minerva engine, everything in splendid running order, sacrifice £28, spot cash, owner buying car. H. H., Ferndale, Church Road, Moseley, Birmingham. 902a

1902 MINERVA CENTAUR bicycle, Clincher A 1, best condition, nearly new, with spare parts, £32; trial by appointment. Fenton, Brackley. 900a

GENUINE Minerva bicycle, new few months ago, spare parts, any trial allowed, sell sacrifice. Walker, 58, Ethelred Street, Kennington Cross, S.E. 906a

QUADRANT 1½ h.p. motor-bicycle, new September last, splendid condition, two lamps, extra accumulator, horn, etc., £35; can be seen and tried. Lindner, Hawkhurst, Derry Downs, St. Mary Cray. 907a

ORMONDE (2 h.p.), new June last, in perfect running order, will accept offers or part exchange for Century tandem. Beachcroft, High Street, Exeter. 909a

2½ h.p. MINERVA, built by Rothwell, Longuemare carburetter, 2 in. Dunlops, plated rims, two brakes, quite new, will do 45 an hour, bargain, £39. May, Sandpits, Birmingham. 911a

BEESTON HUMBER, 1¾ h.p., belt-driven bicycle, mixture, advance, spark, and exhaust controlled from handlebar, perfect condition, new last May, cost £55 price £38 10s., seen any time. Such, care of French and Co., 1, Ramsden Road, Balham. 923b

1902 PHŒNIX, hub two-speed gear, spring pillar, guaranteed faultless, photo sent, offers. See "Wanted." Johns, 51, Anson Road, Cricklewood. 927b

REX 2 h.p. bicycle, perfect order, very good hill climber, spare valves, etc., £37. B. G. W., 33, Jesus Lane, Cambridge. 928a

ORMONDE, nearly new and good as new, Lincona belt, McCurd's supports, perfect condition, 35 guineas. Dr. Simmons, 216, Ashley Gardens, Victoria Street, S.W. 49a

HUMBER motor-bicycle, 2 h.p., chain driven, practically new, Dunlop motor tyres, bargain, £40. H. Plumbridge, 10, Broad Street Station, London. 32a

SHAW motor-bicycle, 2¾ h.p., chain driven, splendid condition, new last April, maker's price £50, sacrifice £39, no exchange. Lapworth, Arundel. 33a

ORMONDE, 24 in frame, new July, F.N. carburetter, Lincona belt, splendid condition, £30. King, 3, Dorset Buildings, Salisbury Square, Fleet Street. 36a

BRAND new 1902 English Werner, rear driven, guaranteed faultless, makers' price £50, for immediate realisation, take £37, satisfactory reasons for selling explained. Owen, 2, Sparrow Corner, Minories, London, E.C. 39a

AURORA, 2 h.p., quite new, Clincher A 1 tyres, rim brakes, exhaust lift, fast and powerful; what offers? 37, Church Street, Kensington. 41a

WERNER, latest rear-driving pattern, with all improvements, extra powerful engine, climb any hill, guaranteed perfect, little used, splendid condition, any trial given, great bargain, £30. Motor, 30, Fordingley Road, Paddington, W. 44a

CHATER LEA Minerva motorcycle, Clincher tyres, nearly new, seen and tried in London, £21. Colgrove, 102, Balls Pond Road, London, N. 45b

BEESTON HUMBER, chain driven, motorcycle, 2 h.p., ridden about 300 miles, £40, or very near offer. 137, Chesnut Road, Plumstead. 47a

QUADRANT, 1¼ h.p., just overhauled, Clincher A Won tyres, £25, or offer. A., 14, St. Faith's Road, W. Norwood. 48a

EXCELSIOR motor-bicycle, 2¾ h.p., Lincona belt, cantilever head, luggage carrier, spare new belt, and all accessories, price £50; can be seen and tried any time. "Brockley Jack," Brockley, S.E. 50a

SINGER, lady's, suitable for lady or gentleman, only ridden 1,000 miles, recently overhauled by maker, in excellent going order, with extra tank, luggage carrier and stand, £35. A. H., 8, Warrior Square Terrace, St. Leonards-on-Sea. 53a

ROYAL ENFIELD, in splendid condition, very smart machine, can be seen and tried any time by appointment, price, including tools, lamp, and spare parts, £28, lowest. W. J. S., 119, Cambridge Gardens, North Kensington, W. 54a

MOTOR-BIKE, 2 h.p., frame only needs repair, costing about 30s., owner buying tricycle, and guarantees reliable and perfect condition bar frame, good hill climber, fast machine, £28 10s., or near offer. Seen, W., 5, Ridgmount Street, Tottenham Court Road, W.C. 55a

F.N. MOTOR-BICYCLE, nearly new condition, Dunlop tyres, thoroughly reliable, bargain, £35; seen any time. 5, Balfour Road, Ilford, E. 56b

HOLDEN motorcycle, as new, only ridden few hundred miles, four-cylinder, water-cooled, 3¼ h.p., faultless, buying car, will demonstrate; no offers, lowest cash price £45, cost £75. Cheetham, Chemist, Louth, Lincs. 58a

WERNER, 1901, front driver, splendid condition, spare valves, belt, etc., Clinchers, Bowden brake, fast and good hill climber, £20. Riley, 12, Part Parade, Cambridge. 65a

ROYAL ENFIELD, 1¾ h.p., in perfect condition, and splendid running order, Lincona belt, spare valves, tools, etc., price £30 cash; trial by appointment. Herbert Jenks, Southbank, Compton, Wolverhampton. 68a

MOTOR-BICYCLE, 1½ h.p. Minerva engine, Chater Lea fittings, Clincher tyres, Brooks' B 90 saddle, Bowden exhaust lifter, every part in splendid condition, £25 cash. J. Andrews, Abbotsford Road, Redland, Bristol. 66a

The Following are Trade Advertisements:

WHEN coming to the Shows bring your old motors with you, and make a point of seeing Wilbee, of Rickmansworth. 815a

DON'T forget, cash, instalments, exchange (motors or cycles). Five per cent. only for year's booking; most makes supplied at this at Wilbee's. 816a

WHAT you want is something reliable, satisfaction, fair dealing. See what others say about Wilbee, Rickmansworth. Get copies testimonials. Stamp. 817a

AGENT for Clyde, Humber, Minerva, Ormonde, Princeps, Quadrant, Werner; most makes supplied; always sound secondhand ones in stock. Wilbee, Rickmansworth. 818a

Two 3½ BENZ, 1¾ De Dion tricycle, 2¼ air-cooled quad, 4 h.p. partly built car. Call and see Wilbee, Rickmansworth. 819a

RIVEL motorcycle, 1¾ h.p. Minerva engine, in perfect condition, only been ridden by expert, two rim brakes, exhaust valve lifter, Dunlop tyres, £35, or offer. Expert, 27, Palmerston Road, Forest Gate, E. 813a

MOTOR-BICYCLES! Motor-bicycles!! Motor-bicycles!!! New Werner 1½ h.p., flat belt, latest pattern, £35. New Minerva, 1¾ h.p., £32 10s. The Motor Mart, Limited, 108, Euston Road, London.

BELVEDERE motor-bicycle, new, £30. Front-drive Werner bicycles. £15, £18, £20 The Motor Mart, Limited. 108, Euston Road, London.

HOLDEN 3 h.p. motor-bicycle, £60. New Crypto, £30. Humber, 2 h.p., chain-driven bicycle, £37 10s. The Motor Mart, Limited, 108, Euston Road, London. 890a

QUADRANT, 1902, Clincher tyres, 1½ h.p., good condition, £30. Birmingham and Coventry Cycle Company, Southampton. 915a

THE 1903 "Motobike" is now ready; 1½ h.p., £35. 2 h.p., £37 10s.; 2½ h.p., £40. All Minerva engines. The Beeston Motor Works, Scunthorpe. 917a

CLEARANCE lines. 1¾ Werner, B.S.A. throughout, English make, grand condition; ditto, 2 h.p., valve lifter, etc., £22 10s. each. Brand new English Werner, rear driven, special machine, £40; another, English, slightly soiled, £35; Coventry Eagle, 2¾ De Dion, just delivered, £45; Eadie quad, 2¾ Dion, £40; Eadie tricycle, 2¾ Dion, £39. Any trials. Heath and Co., 123, Holloway Head, Birmingham. 921a

TRENT motor-bicycles, £35, fastest and most reliable on the market; 2¾ motor, £12; castings, 65s.; 1¾, £8 10s.; castings, 45s. Complete sets all part for building. Trent and Co., Wells Road, Shepherd's Bush. 884d

CLEMONT motor-bicycle, 1½ h.p., Palmer tyres, spare set of accumulators and petrol tank, spring seat pillar, not been ridden 300 miles, in good condition, £25. Neason, 91, Granby Street, Liverpool 883a

MINERVA bicycle, Dunlop tyres, Smith's bands, Bowden brake, front rim brake, valve lifter, not ridden 200 miles, £25; or exchange electric lighting and charging plant, with not less than 2 h.p. gas engine. Smith, 230, Westbourne Grove. 897a

MOTOR-BICYCLE, 2¾ h.p., genuine De Dion engine, valve lifter, perfect as new, lowest, £27 10s.; trailer, ridden 170 miles, £5; De Dion carburetter, 18s. 6d., new. Stannard, Reigate. 60a

Motor-Tricycles.

ARIEL tricycle, 2¾ h.p., spare parts, £45, perfect order, any trial. C. A. Smith, "White Lion Hotel," Cobham, Portsmouth Road, Surrey. 896zzz

DE DION tricycle, Dunlops, brass tank, spare parts, in urgent need of money, therefore any reasonable offer; seen any time. C., 28, Albion Road, Clapham, S.W. 916a

SINGER tricycle, purchased direct from Singers last May, very little used, good as new, owner buying car, price £50. E. Pollock, 47, Temple, London. 52a

The Following are Trade Advertisements:

MOTOR-TRICYCLE, £22 10s., or complete with trailer, £27 10s., in good condition: Kitto motor-bicycle, £20; Ormonde motor-bicycle, £16; Werner front driver, speedy machine, 2 in. Clincher tyres, good condition, £22. Motorcycles on hire. Central Motor Company, 46a, Tottenham Street, Tottenham Court Road. Telephone, 1330 Gerrard. 78a

1¾ h.p. GENUINE De Dion water-cooled tricycle, radiators, free engine, etc., £42 10s. The Motor Mart, Limited, 108, Euston Road, London.

1¾ h.p. ARIEL tricycle, Warwick tyres, £42 10s. The Motor Mart, Limited, 108, Euston Road, London. 889a

MOTOR-TRICYCLE 2¼ h.p. genuine De Dion engine, air-cooled, in splendid condition, shop soiled, Grappler tyres, seen any time, what offers? Orleans Cycle Works, Cross Deep, Twickenham. 880a

2¼ h.p. MOTOR-TRICYCLE, in good order, Goodrich tyres, can be seen running, £38, or near offer, with trailer. Lea Machine Company, 14b, Lea Bridge Road, Clapton. 925a

QUADRANT, 1902, one lever, £35. Minerva, 1½ h.p., chain drive on Bowden clutch, exhaust lift, £33. 2¼ trike, £20. Aurora, 2 h.p., £33. Cash or exchange; ordinary cycles taken. Loco Style, two, £100. Decauville, 5 h.p., £110. Borham, 122, Hammersmith Road, W. 69a

Motor Quads.

M.M.C. QUAD, extra wheel, 3 h.p., convertible to trike, good condition, electric ignition, Dunlops, valve lifter, £35, or nearest offer. Motor Mart, 108, Euston Road, London. 796a

ARIEL quad, 3½ h.p., two-speed, water-cooled, every improvement, five complete tyres (three new), footboards, making it as comfortable as a car, spring saddle pillar, blinds and brushes to all wheels, keeps all mud down, absolutely perfect condition, any trial. Write May, Sandpits, Birmingham. 910a

GENUINE De Dion quad, 2¾ h.p., two speeds, water-cooled, three brakes, Michelin tyres (unpunctured), luxurious doubled-springed carriage body, front upholstered in red morocco, Peto Radford accumulator, perfect running order, price £60. Peters, Holmsdale, Leigh-on-Sea, Essex. 931b

3½ h.p. QUAD, De Dion engine, water-cooled, valve lifter, recently overhauled, good going order, spare parts, £32, or nearest offer. Millar, 87, Fulham Palace Road, Hammersmith. 38a

QUAD, 3½ h.p., water-cooled, with radiators, two-speed gear and free engine, very powerful, will climb anything, exhaust lifter, large plated tank for petrol oil and water, enamel and plating as new, also spare wheel and tyre for conversion to tricycle, extra double front seat, lamp, horn, and accessories, price £52 to quick purchaser. Lichlemburg, 35a, High Street, Kensington. 67a

Trailers.

TRAILERS. Illustrated lists free, return mail. Austral Patent Trailing Car Company, Shaftesbury Road, Leicester. Stand 115 at Stanley Show. 770a

WICKER trailer, finest close wicker body, brand new, 2 in. tyres, never used, owner has bought Whippet, price £7, cost £8 10s. May, Sandpits, Birmingham. 885a

MILFORD trailer, run 250 miles, as new, plated springs, sacrifice £5. H H., Ferndale, Church Road, Moseley, Birmingham. 905a

WHIPPET pattern trailer, Dennis Bros., fit Dion axle bridge, excellent condition, £5, cost £15. H. C. L., Springfield, Walton-on-Thames. 924a

SUNBEAM trailer, Dunlop tyres (new), £2, cash wanted, genuine bargain. H. Duckett, Stolford Lodge, Ashcombe Road, Weston-super-Mare. 929a

WHIPPET pattern trailer, suit lady or gentleman, fit 1¾ in. bridge tube, splendid condition, £10 10s. E. Clarke, 12, Salisbury Square, Fleet Street 59a

Miscellaneous.

EXCELSIOR acetylene lamp, as new, only used once, with extra burner, 8s. A., Magnolia House, Chiswick Mall. 930a

42 "AUTOCARS," 68 "Motorcar Journals," all "Motor Cyclings," lot 10s. Luxurious pigskin tricycle seat, saddle pillar, tool rack behind, 17s. 6d., cost 63s. 1, Radnor Terrace, Salisbury. 920a

PATTERNS for 2 h.p. motor, complete, 2⅝ bore, 2¾ stroke, cost £8, reasonable offers; also two sets of castings from above (aluminium boxes), 25s each. C. Wilson, 91, Widdrington Road, Coventry. 37a

"MOTOR CYCLING," Vol. I., absolutely perfect and complete, post free, 6s. S. H. G., 66, Colworth Road, Leytonstone, N.E. 42a

FOR SALE, patent rights of friction chain for driving motorcycles, motorcars, and other machinery, light, strong, flexible, and possessing good grip, can be made cheap. Apply, C. Willis, 100, Wolverhampton Street, Bilston. 57a

The following are Trade Advertisements:

TYRES! Patent motorcycle covers, fitted with 24oz. Para rubbers, price 15s. 6d. Freeman and Co., Tyre Manufacturers, Paddington, Liverpool. 702a

EXPERT advice free. Valuations, etc. Six years' practical experience, eight club awards. E. J. Coles, 7a, Princes Street, Oxford Circus, London, W. 734zzz

FREESTONE'S variable gear for motor bicycles and tricycles, free engine, several speeds, comfortable seat and foot rests, tandem seat, three times the power with same engine, started with handle, tricycles converted to carriages. South Road, Saffron Walden. 852a

MOTOR-BICYCLE tyres. Clearance line of Dunlop Bartlett tandem covers, 28 by 2, 14s. each net cash. Warburton, Allen and Co., Leicester. 812c

THE Motor Mart, Limited, are not exhibiting at the Agricultural Hall this year; but they are still at 108, Euston Road, London.

OUR Show, as everybody knows, is at 108, Euston Road. You cannot see a better exhibition, go where you may. Only 1d. fare from one Show to the Motor Mart, Limited.

THE Motor Mart, Limited, have got everything one wishes to see and try at their Showrooms, 108, Euston Road, London.

DON'T be misled by certain firms who have been good enough to use our name. We are the only original Motor Mart, Limited, of 108, Euston Road, London. 891a

FOR SALE, at an exceptionally low figure, a motorcycle business, including all necessary tools, patterns, and materials for carrying on same. Reply, P., care of "Motor Cycling." 881a

2 h.p. BICYCLE motors. Motors. Motors. Motors. Motors. 30s. set. List three stamps. Below.

MOTORS. Motors. Motors. Motors. Motors. Motors. 30s. List three stamps. Below.

2 h.p. MOTORS, half made, remarkable value, 30s. Below.

2 h.p. MOTORS, half made, remarkable value, 30s. Below.

2 h.p. MOTOR castings, remarkable value, 30s. set. Don't fail to see our list, three stamps. Below.

½ h.p. GAS engines, £8. Below.

½ h.p. OIL engines, £9. Below.

½ h.p. CASTINGS, complete, £2 17s. Value, value, value. See 3d. list. Below.

½ h.p. OIL castings, £2 17s. Below.

ENGINE castings from 18s. set. Below.

BICYCLE motor castings, from 30s. set. Madison, Woolrych Street, Derby. 905a

BICYCLE motor, 1½ and 2 h.p., complete outfit, £12 10s., finished engine, £5, castings, 25s. Tew, 36, Thornhill Road, Leyton. 912a

Wanted.

WANTED to exchange 1 h.p. steam engine, launch pattern, for motor engine. Elliott, 82, Park End, Bromley, Kent. 893a

WANTED, tricycle, 2¾ water-cooled, De Dion, Ariel, or Dennis, in good condition, for cash. Motor, care of Battey. 31, Belgrave Road, S.W. 895a

MOTOR-BIKE, 1¾ or 2 h.p., in exchange for one gent's machine, Morrow hub, as new; one Abingdon lady's, free-wheel, two rim brakes, as new; 1 2¼ motor, new. H. Baigent, Hughenden Road, High Wycombe. 901a

WANTED, Ixion motor set or complete machine, exchange new Coventry, up-to-date, free-wheel roadster, and cash. Randle, Wood Street, Kettering. 904a

WANTED, 2¾ Excelsior or other high-powered bicycle; exchange 1902 Phœnix with cash to value. Johns, 51, Anson Road, Cricklewood. 844a

WANTED, 1¾ h.p. Minerva bicycle engine, exchange 1¼ h.p. and cash, approval. R. I. Whittingham, Cushworth, Doncaster. 908a

SERVICEABLE motor-bike wanted in exchange for Edison-Bell Commercial phonograph, highest type made; finest electric motor, all complete, perfect condition, cost over £26, what offers? G. Key, Rugeley 913a

WANTED, two-speed gear for motor quad, also voltmeter. Write particulars, T. F. Worgan, Junr., Hucclecote. 914a

WANTED, for cash, Ariel quad, or small car, price, condition, and full particulars to W. E. White, Bolsover. 61a

WANTED, motor-bicycle, any condition, full value given, or would exchange bicycle, with cash. Engineer, 29, Claude Road, Upton, Essex. 62a

Motorcars.

PEUGEOT 3½ h.p. voiturette, twin-cylinder, tube ignition, good condition. Can be seen by appointment. Price £110, or exchange. Apply, E., care of "Motor Cycling." zzz

10 h.p. TONNEAU car, seat four or five, double cylinder, new pneumatic tyres, 3½ in., £180; or will accept motor-bike, quad, and cash. A. C. C., 2, Addington Road, Bow. 857a

6 h.p. MOTORCAR, seat four, Dunlop tyres, pump, spare parts, £100, would take good motorcycle as part payment. Farish, 613, Old Kent Road. 918a

1902 WERNER, English built, 26 in. frame, condition as new, and in good going order, price £40. H., St. Michael's House, Weybridge. 758a

BENZ car for £50, in good order; may be seen and tried by appointment with Motor, 21, Thane Villas, Holloway, N. 34a

LIGHT car, 3½ genuine Dion, aluminium body (French), artillery wheels, Michelin tyres, perfect, three speeds, reverse, Panhard system, inclined wheel steering, seats three with comfort, three powerful brakes, sprag, lamps, etc., good condition and order, smart appearance, photo, hill climber, very fast, £ cost £180. Owner, 12, Gloucester Road, S.W. 64a

The Following are Trade Advertisements:

6 h.p. DOUBLE-CYLINDER Mors car, artillery wheels, licensed Michelin tyres, seat three, leather hood, accessories, complete, £140. The Motor Mart, Limited, 108, Euston Road, London.

3½ h.p. DE DION Voiturette, lamps, horn, etc., seat four, £100. The Motor Mart, Limited, 108, Euston Road, London.

8 h.p. GENUINE De Dion, Tonneau body, two speeds and reverse, wheel steering, Linley's ignition, extra large radiators, new steel gear, £225. The Motor Mart, Limited, 108, Euston Road, London.

6 h.p. BARDON car, Tonneau body, canopy, wheel steering, three speeds and reverse, artillery wheels, licensed Michelin tyres, £200. The Motor Mart, Limited, 108, Euston Road, London.

9 h.p. DOUBLE-CYLINDER Benz, double phaeton body, hood, artillery wheels, solid tyres, £120. The Motor Mart, Limited, 108, Euston Road, London.

BENZ Brougham, 3½ h.p., three speeds, solid tyres, £65. The Motor Mart, Limited, 108, Euston Road, London.

SIRENE Tonneau, 4½ h.p., three speeds and reverse, requires small repairs, artillery wheels, licensed tyres, £100. The Motor Mart, Limited, 108, Euston Road, London.

THREE-SPEED Benz car, with hood, extra thick hubs, Connolly solid tyres, £80. The Motor Mart, Limited, 108, Euston Road, London.

3½ BENZ, £75. Two-speed Star cars from £40 £65, and £85. One genuine Leon Bollee, 3½ h.p., £36 10s. The Motor Mart, Limited, 108, Euston Road, London.

6 h.p. BOYER, Tonneau body, artillery wheels, licensed Michelin tyres, £140. The Motor Mart, Limited, 108, Euston Road, London.

6 h.p. PICK Voiturette, two speeds by belts, seat two, engine in front, artillery equal-sized wheels, licensed tyres, £150. The Motor Mart, Limited, 108, Euston Road, London.

MARSHALL car, 5 h.p., seat five, solid tyres, back wheels artillery, front wire wheels, £75. The Motor Mart, Limited, 108, Euston Road, London.

6 h.p. DAIMLER waggonette, wheel steering, four speeds and reverse, detachable canopy, seat eight and driver, guarantee, £200. The Motor Mart, Limited, 108, Euston Road, London.

6 h.p. BOYER Tonneau, new, artillery wheels, licensed tyres, £210. The Motor Mart, Limited, 108 Euston Road, London.

12 h.p. TONNEAU, double-cylinder Aster engine, very up-to-date car, wheel steering, three speeds and reverse, artillery equal-sized wheels, licensed Michelin tyres, £260. The Motor Mart, Limited, 108, Euston Road, London.

6 h.p. PANHARD LEVASSOR, Tonneau body, wheel steering, three speeds and reverse, side levers, artillery wheels, solid tyres, £200. The Motor Mart, Limited, 108, Euston Road, London.

4½ h.p. PROGRESS Voiturette, genuine De Dion engine, two speeds, seat four, £110. The Motor Mart, Limited, 108, Euston Road, London. 886a

7 h.p. NEW ORLEANS, Tonneau body, wheel steering, three speeds and reverse, £190. The Motor Mart, Limited, 108, Euston Road, London.

8 h.p. GILLET FORREST, Tonneau body, three speeds and reverse, wheel steering, artillery wheels, licensed tyres, £300. The Motor Mart, Limited, 108, Euston Road, London.

18 h.p. DAIMLER Tonneau, cost £1,450 eighteen months since, run only 1,500 miles, price £750. The Motor Mart, Limited, 108, Euston Road, London.

3½ h.p. MAYFAIR Voiturette, seat two, genuine De Dion engine, £75. The Motor Mart, Limited, 108, Euston Road, London.

3½ h.p. RACING De Dion, wheel steering, three speeds and reverse, £85. The Motor Mart, Limited, 108, Euston Road, London.

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SINGER tandem tricycle, 2½ h.p., absolutely new, as received from Singers, and unused, lady's seat behind, pump lubrication, extra petrol tank, horn, motor stand, owner ordered abroad, price £80. "Motor Cycling" Deposit System. Capt. Burton, Shirley Holmes, Lymington, Hants. 43c

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SALE or exchange privately, Mottet, by British Motor Syndicate, free engine, three speeds, electric ignition, spray carburetter, adjustable governor and Dunlop tyres, new accessories include three gas lamps, spare accumulator, horn, tools, etc.; thoroughly overhauled this month, seats two, very compact and ready for use, inspection invited, and trial given any evening after eight, or morning before nine, reason for sale or exchange given to purchaser, photograph if desired, price £45, or would exchange for either new Singer tricycle, new genuine De Dion tricycle, or small reliable Benz car. Apply by letter for appointment, in first instance, to Mr. Hermann, 64, High Street, Notting Hill Gate, London, W. 789a

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