

## CHANGING GEAR.

AN ARTICLE WHICH IS NOT ADDRESSED TO THE SKILLED DRIVER.

To the large class who are making their first acquaintance with the delightful pastime of motoring the greatest difficulty that presents itself seems to be changing gear with ease and certainty. The quietness of movement attained by the practical driver is envied, and the beginner endeavours to emulate it, sometimes with success, but more often his efforts are attended by a jarring and grinding of the gear teeth, which is not alone painful to listen to, but results in serious damage to some of the most vital portions of the car mechanism. The Panhard type of sliding spur-wheel gear being now universally used, these notes may be considered as applying to that style only, and in defining the right and wrong way of attaining the desired object the full understanding of the principle of the gear movement will elucidate the reasons for noise when the clutch or change-speed lever are improperly used.

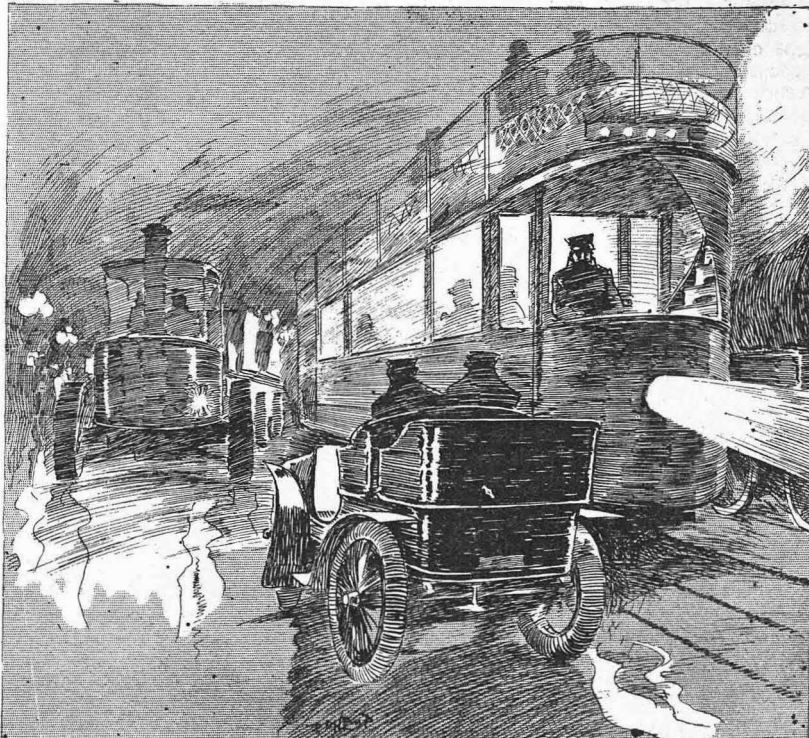
### THE TWO SHAFTS IN THE GEAR-BOX

are called respectively the first motion shaft and second motion shaft: the power is transmitted from the engine via the clutch to the first shaft and the spur-wheels upon this, meshing with the spur-wheels of the second shaft, conveying the motion to the rear axle by means of chains or a cardan shaft. The teeth of all the spur wheels are rounded at their first points of contact with each other to ensure them sliding properly into position. The clutch is practically composed of two members, each with a coned surface of the same angle, fitting each other, the entering member being usually covered with leather: in some cases the external member moves and its internal face is then leather covered, but the result is identical.

We will suppose that the engine has been started up, the driver taken his seat, the change-speed lever being in the neutral notch of the quadrant (free engine position);

the lever is moved, the pedal connecting to the clutch being often depressed: this disconnects the engine entirely from the gear wheels. If any attempt be made to move the speed lever, with engine running, without releasing the clutch, the teeth of the gear wheels upon the first motion shaft might be badly damaged. Occasionally, the gear wheels will not mesh, and consequently the lever will not find its way into the first (or lowest speed) notch of the quadrant. The usual plan under such circumstances is to ease up the clutch pedal very slightly, and giving the engine a slight grip of the clutch moves the first motion shaft gently around: as soon as the movement of the shaft commences the clutch is taken out, and it will be found that the first speed can then be found. It is a method not to be recommended in the early stages of driving and needs some knack to manage the action without noise. For the novice stage it is preferable to depress the clutch as usual, having the lever in the neutral notch: wait for a few seconds to ensure the first motion shaft coming to rest, and then, but not before, try to move the lever forward: if the grating noise is heard it will be a proof that the first shaft is still

revolving, and further time should be allowed for it to cease movement; whilst, if the lever will not pass along the quadrant to the proper notch, but appears to jam, the teeth of the gear wheels are not in the correct position for meshing. The lever should be brought back to the neutral notch, the clutch gently released so that movement of the first motion shaft is again obtained, the pedal being fully depressed. The whole operation can be repeated, until it is certain the first gear is ready to take up the work. The car is still, and the movement must be given to the road wheels, and to secure this two movements are made—one by the clutch and one by the change lever. We have seen how the last can be made to engage sweetly, and if



A TRAFFIC PROBLEM ON A NOVEMBER DAY.

### Changing Gear— Contd.

care be used the clutch will gently pick the pace up until the fastest speed (upon the lowest gear) has been attained. After the lever has been moved the clutch must not be suddenly let in with a jerk and a bang, but the foot should be gently raised, so that the engine power is very, very slowly communicated to the rear wheels. The "quick start" method is one of the little tricks of driving suitable only for getting off the mark in speed trials and quite out of place upon the road. If adopted, its foolishness will quickly be brought out by the effects upon engine, gears, and tyres. Letting in the clutch quickly (with car at a standstill) may stop the engine, strip teeth off the gear wheels, or skid the rear wheels over the road before they can secure effective traction; and this last effect may be emphasised if the weight is not evenly distributed throughout the car or the road is muddy. It must never be forgotten that the whole power of the engine can be suddenly thrown upon the gear shafts by careless usage of the clutch, and it is solely to secure gradual application of force that the entering clutch member is leather covered. The strain is thereby gradually distributed over the whole mechanism without excessive pressure upon a single portion. In considering the function the clutch has to perform, an analogy can be found in a thread suspended from a nail and arranged to carry a weight just a fractional amount short of its breaking strain, the thread being several inches in length. Now, if the weight is dropped suddenly for just the length of the thread

THE JERKING STRAIN WILL CERTAINLY BREAK THE THREAD;

but if the weight be taken gradually upon the end of the thread, it will be suspended for an indefinite time. So with the clutch: ease the strain gradually by its means from engine to wheel rim and it will continue to do what is desired; let in the clutch suddenly and something may break. The "slipping" action provided by the leather face of the clutch is a ready means of car control in traffic without the necessity of changing gear frequently if the clutch is in good order; the jerking or banging use of the clutch will quickly remove this "slipping" property, and incautious users will find that the clutch will only take up a position of "right in" or "right out" without any intermediate point. Complaints are occasionally made of what is called a "fierce" clutch. In other words, the clutch will not slide or slip in, but permits the engine to get a hold of it suddenly and almost takes the starting control from the driver's hands. If the design is correct (there are one or two clutches on the market with incorrect angles which nothing will remedy), the trouble can usually be traced to a stone-hard clutch leather, which has been ruined by unskilful usage.

We have eased in the clutch and started slowly off, but there need be no hurry to hasten in with the second speed. Allow the car to have good way upon it, say, by gradually advancing the ignition to half the limit the ignition lever permits, and now try to change up. The conditions are somewhat altered from the first point of standstill to movement; we have now to deal with a slowly-moving car, and we should endeavour to make it run at twice the speed without acquainting the whole neighbourhood with the fact that the change is taking place. The change must be made with certainty and at the first attempt. The proper meshing of the wheels cannot be tried for, but must be allowed to slide of their own accord, for when changing up, if the higher gear cannot be immediately attained, the car will lose its momentum, and when the second gear is eventually got in the extra work put thereby upon the engine will stop it. No great harm is done by this happening; but if, in the midst of traffic, the proceedings are not of a dignified nature when the driver has to suddenly dismount and wind the handle vigorously, being meanwhile the target of sarcastic remarks from surrounding busmen. To change the speed wheels to a higher gear, the clutch pedal must be

fully depressed, so that the clutch is entirely released from the engine; when the clutch is right out, but not a fraction of a second before, move the lever quickly and surely from first speed notch to second speed notch and let the clutch in; the clutch movement may be very slightly accelerated beyond that advised for getting from neutral to first speed, but the movement must still be a gradual one until the clutch is fully home. A part of the preceding sentence, "move the lever from first speed notch to second," is the stumbling-block to most men who find trouble in changing, combined with insufficient depression of the clutch pedal. After driving a car for some time the gear changing becomes as automatic as the steering of a bicycle, but at first many owners find it essential to look at the quadrant as the change is made, to be sure that the lever drops into the right notch. Some men never lose this habit of watching the quadrant, and night driving with them becomes almost a nightmare in hilly districts for fear of missing gear. Now, nearly every change-speed lever is fitted with a spring catch, which drops into one of the desired notches on the lever quadrant, and as a rule it is this catch which is the cause of part of the trouble. The driver, perhaps, clings tightly to the trigger after the lever has reached the side of the notch, and, letting in the clutch at the correct moment, the lever gets knocked back because the gear wheels do not mesh; or he leaves go of the trigger but is uncertain whether the lever is against the notch or half-way between the two speeds. Anyway, he trusts to luck, lets in the clutch, and we are treated to that delightful sound of grinding gear wheels with which we are all too familiar. There is

#### AN ALTERNATIVE TO THIS HAPHAZARD METHOD OF GEAR CHANGING,

which prevents noise, ensures correct movement of the lever, and needs no watching of the quadrant. When the trigger is gripped (together with the lever), time to let go of it the moment the head of the catch tooth has passed the front edge of the notch, and do not touch it again: as the lever is pushed forward the tooth presses upon the face of the quadrant and quite naturally drops into the notch designed to receive it, stopping the lever in the correct position, without any muscular effort upon the driver's part or fear of passing the wished-for notch. Exactly the same use of the tooth and notch can be made for changing down or for getting in the reverse. This method depends entirely upon not letting go the trigger too early, as the lever starts to move, or the lever will be forced back into its original position; but, if carefully practised for a few minutes with the engine stopped, it will be found possible to depend entirely upon the sense of touch. The changes thus made should be tried with every gear in turn, and at first it will be necessary to watch the quadrant to find the exact moment the lever has passed the old notch and is making for the new, so as to drop the tooth upon the quadrant face: some drivers will find it suits them better to drop the tooth midway between notches, and in this respect the personal equation of each driver comes into action.

For changing down speeds upon a hill the lever movement will, of course, be carried out upon a similar method; but the clutch for hill work must be taken out sharply by the foot, and as the foot gets the pedal down to its limit of travel the hand is prepared to pull the lever back quickly to get into the lower speed and the clutch can be let go. Working the clutch uphill requires somewhat different treatment from work upon the level, for the speed of the car is diminishing by reason of the resistance offered by the gradient, and therefore the clutch must be released quickly, the change-speed lever moved quickly, and the clutch again let in quickly, but without a symptom of jerkiness or harsh movement. If the speed gets slow uphill, the change must be made with rapidity, and, perhaps, jerkily, when the engine labours and "knocks," or the car will come to a standstill; this can always be obviated by changing gear before the engine reaches that stage of weariness. In changing gear remember the golden rule whether on the level, uphill, or reversing: Always, without any exception, entirely disengage clutch before attempting a change.

## THE TRI-CAR: ITS ADVANTAGES.

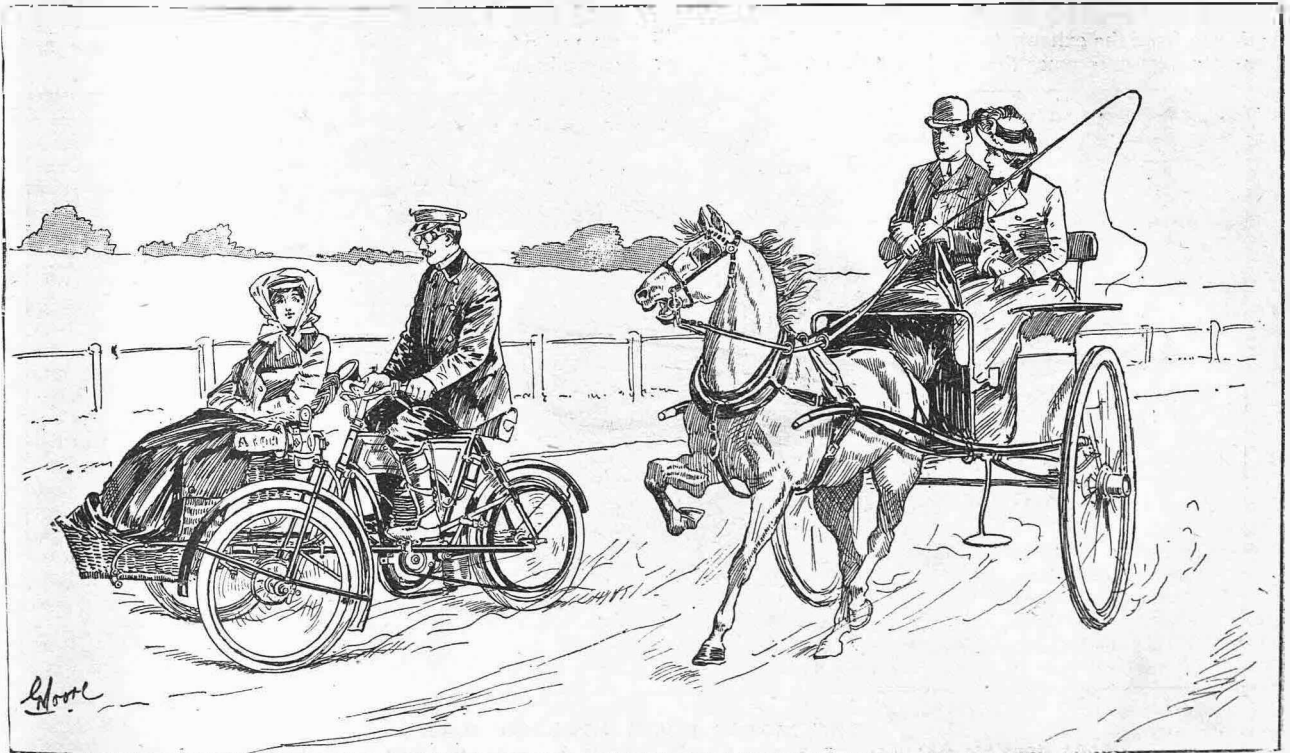
By "CYCLOMOT."

Man, being a gregarious animal, seldom likes to indulge in sorrow or pleasure entirely alone. Even fishermen (it has been observed) like to have company as they sit all day on a damp bank watching an idle float, although, maybe, never a word is exchanged. Man soon discovered that the motor-bicycle induced a separation or scattering of any party of riders, and it became evident, at an early period of the new pastime, that if a rider desired company he must take it with him, and so some genius (generally admitted to be J. van Hooydonk) invented the tri-car—a machine for two which jumped into an exceedingly great popularity, because it met the want that was felt and that was wanted to be felt. Being quite a new scheme, in a measure (for the Olympia tandem and such like gave us the same pleasure, in a modified degree, in our cycling days), there are many opinions as to its details and almost as many as to its future. Every motorist one meets has his own notion of the "ideal tri-car": sometimes it is practically the machine which he has been riding for a more or less lengthy period: sometimes it is a fantastic notion of his own which, if it could be made, would (so he assures his listener) revolutionise the pastime and create a sensation in the trade. In fact, the tri-car has afforded wonderful scope for ingenuity (both useful and misplaced): more so than either the motor-bicycle or the car, for it permits of the combination of the ideas that appertain to each, and the result is that the idealist wants to embody in one vehicle all the good points of each type with none of the objections. If you could, in fact, get him into a corner and induce him to uncurtain his inmost soul, you would find that he wants a sort of six-cylindered high-powered comfortable car at the price of a well-made motor-bicycle!

As to the future of the tri-car, opinions vary according to their holder's point of view and personal circumstances. For myself, I do not, for one instant, think that the motor-car will oust it from the market, as some allege. I have always contended that the buying public can be split up into innumerable sections with pockets of widely-differing

capacities; that there are £20, £30, £40, £50, £60, £70 sections (and so on *ad infinitum*), and that for the man who will strain himself to pay £60 for a vehicle, the purchase of a little car at £100 or £120, however wonderful in value, would be an impossible achievement. If this be admitted, it will be obvious that the tri-car will always fill the gap between the single-seated motor-bicycle and the light car, although it may not be improbable that a development of the back axle might lead to the addition of a fourth wheel so that the result was a quadricycle with but two road tracks instead of three. But, as that is very much in the future, let us examine the tri-car of to-day and consider to what extent it fills the needs of the man who desires to limit his capital outlay and the cost of upkeep.

It is precisely upon the matter of expense that the tri-car scores. Any rider prepared for an initial outlay of from £60 to £90 will have a wide choice of machines and, at a less figure than the first-named, he will do well with a second-hand machine. He need not restrict himself in the matter of pace, comfort, quality or efficiency as I shall show, and from the very outset he will find that, because his machine comes within the definition adopted by the Local Government Board on the suggestion of the Auto-Cycle Club, which says that a motorcycle is a vehicle having not more than three wheels and weighing not more than 3 cwt., he is only called upon to pay 15s. for its registration (instead of 42s.), or 1s. for a registration of new ownership (instead of 5s.), and 15s. the annual Inland Revenue tax (instead of the 42s. demanded in respect of a car). These represent a substantial saving which finds an echo in the economy with which the vehicle can be run. Petrol consumption may not be more than a gallon per hundred miles, but if the engine is of rather large horse-power, and a two or three-speed gear is employed, the consumption over a moderately hilly piece of country may amount to a couple of gallons per hundred miles. But even this latter figure is more economical than could be shown by a car with the most modest consumption of petrol. In the same way the expenditure on



THE OLD AND THE NEW STYLES.

**The Tri-car:  
Its Advantages.—Contd.**

oils, tyres, and every other item of upkeep is exceedingly small, and thus it may with truth be said that the cost of keeping a tri-car which can give a wealth of pleasure to two people is so small as to be out of all comparison with most other forms of locomotion.

As to pace, any tri-car that is well designed can maintain an average speed, on an all-day run, of quite 20 miles an hour. It can do considerably more on level roads if suitably geared, and it can take average hills at from 10 to 14 miles an hour or thereabouts. The reasons for this are that the weight of the machine is light, and that there is but the merest fraction of loss in transmission—the crank-shaft of the engine and the hub of the driving wheel are parallel to each other, and with a direct belt drive the absorption of power on the transmission should not exceed ten per cent. On a car it sometimes reaches 45 per cent. The introduction of a two or three-speed gear will make a difference when the gear is in action, but in any case the loss is small. As to weight, this is showing a tendency to grow, necessitating more power and more efficient means of keeping the engine cool, which again increases weight. My own opinion is that air-cooling has been too lightly cast aside by many of the makers. Say they, "the additional cost of casting a water-cooled engine in place of one that is air-cooled is not worth talking about," but they overlook the fact that the tank and radiators and pipes and pump all with their load of water (which will weigh from 15 to 20 lb. alone) are so much dead weight, and that, moreover, the difficulties of maintaining perfect water joints throughout any system are aggravated by the impossibility of securing adequate supports for its component parts or insulating them from the evil effects of vibration. Air-cooling presents a certain amount of difficulty because of the shielding effect of the passenger body, whilst when the engine is working at normal speed on hills, and the vehicle is travelling but slowly the volume of air playing on the cylinder walls is greatly reduced. But a well-designed fan driven either direct from a pulley on the crank-shaft or operated by another fan which is driven from the exhaust (a method employed on one well-known make) overcomes the whole difficulty, and Professor

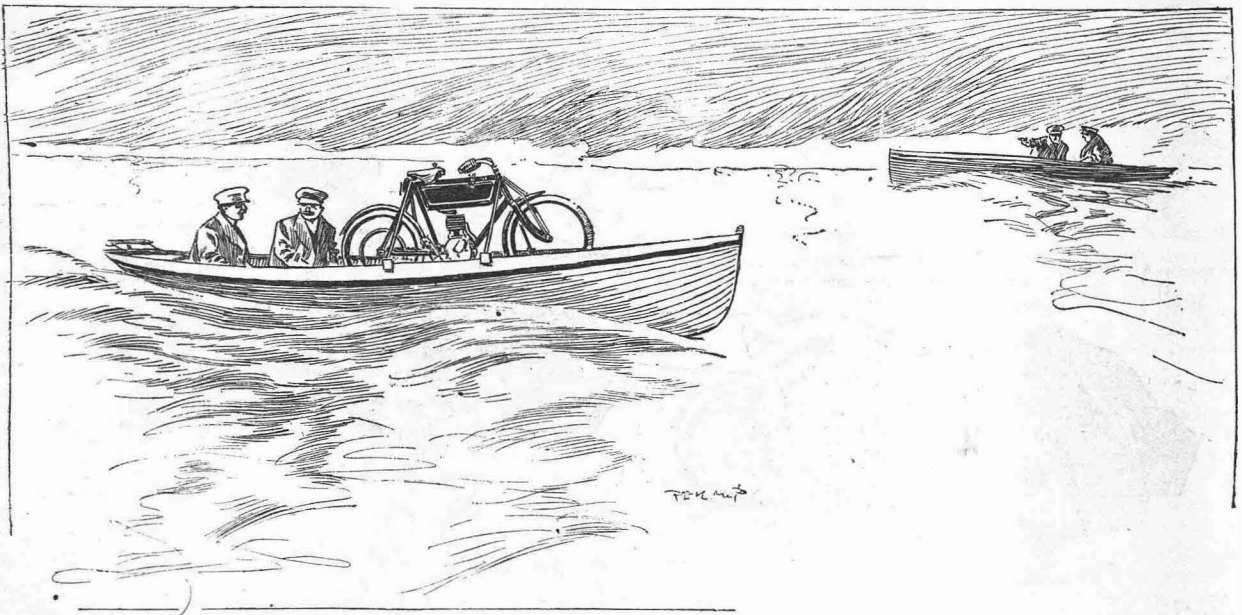
Callender has amply proved that with fan-cooling he obtains wonderful efficiency from his little 1½ h.p. engine. I met him and Mrs. Callender in Hereford a couple of months ago and was simply astonished at the way in which his tri-car climbed hills. Had there been aught that was wrong with the cooling of the engine the fact would have asserted itself on the hilly country in which he was then touring.

The tri-car scores in many ways over other motor vehicles. Whilst the out-of-pocket expenses in connection with it differ in only a slight degree from the cost of running a motor-bicycle, it has the inestimable advantage of carrying two people and of thus giving just twice as much pleasure as the single-seater. It occupies but a little more stable room than the cycle, and is not regarded by the hotel proprietor as a luxurious vehicle, the occupants of which (in his estimation) are fair game to be fleeced. So garage charges and hotel accommodation are generally more moderate. In the case of a mishap, the mechanism is so much simpler that the fault is very readily located, and the absence of certain complicated parts in the transmission system materially reduces the risk of such mishaps. Should the mishap be serious, the chain or belt can be removed and, provided pedalling gear has not been dispensed with, the machine can be pedalled to a convenient stopping or repair place. A car does not permit of this.

In the matter of comfort, I am a great advocate for the most perfect insulation of both the driver and the passenger from road shocks and engine vibration, and I think more attention should be paid to these matters than has hitherto been done. The removal of the rear wheel for the purpose of replacing a cover or air-tube should be made easier than is usually the case, and it would pay owners to adopt either the Self-sealing air-tube, which from personal experience on a car I can recommend, or the butt-ended inner tubes which can be replaced without necessitating the removal of the wheel.

One advantage of the tri-car over the car is that brakes can be applied to all wheels. The total amount of brake power is thus invariably ample and, moreover, none of it is dependent upon the transmission being complete.

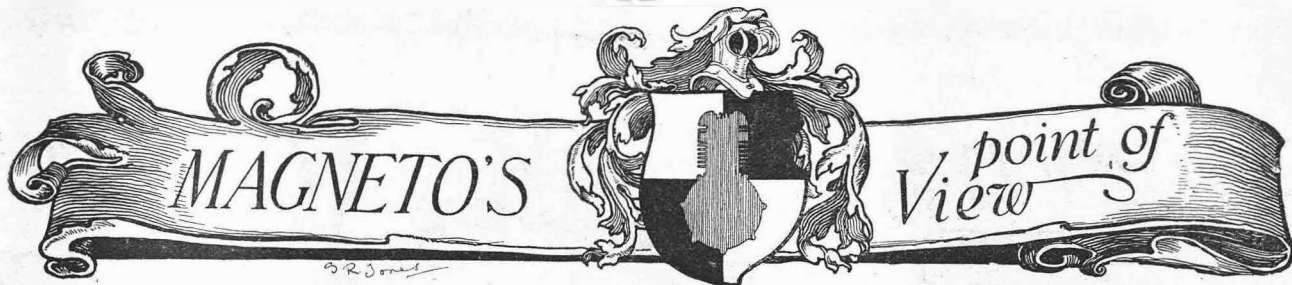
One could go on retailing little points of advantage possessed by the tri-car, but I think enough has been said to prove that it is a very efficient vehicle, and that the car has a lot to do to oust it from a place in the affections of the man who desires to obtain his motor experiences at a modest expenditure.



**THE MOTOR (BIKE) ASSISTED BOAT.**

Jones stows his motor in his boat and, with extra belt and bevels, and propeller, produces an amphibious means of travelling.





### Concerning Trembler Coils.

Despite the convenience of the trembler coil, inasmuch as it does away with the troublesome necessity of trimming and adjusting platinum contacts on the make and break, it is, nevertheless, liable to give rise to occasional stoppages, or at least misfiring, unless certain details are carefully attended to. For instance, with a high-speed engine, to get regular firing at high speeds the coil trembler must vibrate exceedingly fast to be able to give a series of sparks per contact. A little consideration will show that the sector on the brush contact is supposed to be so set that a spark or series of sparks must occur at the instant it touches the brush to get accurate timing. This can only be so if the trembler on the coil is set to vibrate at the highest possible speed. Should it vibrate relatively slowly, the spark may not occur till the sector on the brush contact is leaving the brush. This will obviously cause the charge to fire much later than it should. As an instance of how fast a coil trembler has to vibrate to give even as few as two consecutive sparks per contact, suppose the engine is only running at a fair speed of 1,200 revs. per minute. The brush contact disc will revolve once in 1-10th second, but it is only making contact  $\frac{1}{4}$ th of the complete revolution or for 1-80th part of a second. To give but two sparks in that time the trembler must vibrate at the rate of 9,600 times per minute. To give four sparks it must vibrate at the rate of 19,200 times per minute. Now, the speed of the trembler is a detail of prime importance in getting successful firing. Making the contact sector longer will not compensate for a slow trembler; as this obviously means that the timing cannot possibly be accurate. Suppose the sector be made  $\frac{1}{4}$ th instead of  $\frac{1}{8}$ th the circumference of the disc, it is impossible to determine at what part of the contact the spark and ignition will occur. It is for this reason that many experienced racing men prefer a plain coil with make and break, because there can be no doubt that the charge must explode at the instant the contacts break, and the engine can be timed accordingly.

### Pre-ignition.

Premature firing of the charge often accounts for many curious happenings, both on car and cycle engines. It is usual to blame the inlet valve if it happens that a puff of smoke issues from the carburettor air inlet or curious popping noises occur in the inlet pipe. It is generally suspected that the spring is too weak or has got burnt, or that the valve stem is sticking in the guide. More often than not attempts to improve the valve make no difference. What really happens is that the incoming charge ignites while the valve is still open, and the flame travels back through the pipe. The actual cause of this pre-ignition may be one of several. For instance, when an engine has a deep valve pocket with the inlet placed directly over the exhaust it is quite probable that a fired charge may not have been as completely swept out on the exhaust stroke as it might. It would thus happen that a fresh charge entering through the inlet would come in contact with this gas, which would be at a sufficiently high temperature to fire it. The flame would then travel back through the open valve. An overheated exhaust valve head might also cause ignition. The exhaust might be throttled in some way, as, for instance, by the lift being reduced through

wear of the cam or tappet, or from the silencer being too small. The claim is often advanced that by arranging the exhaust valve and inlet one below the other the incoming fresh gas tends to keep the valves cool. Doubtless this is true, but, at the same time, if by chance overheating should occur at the exhaust chamber, there is more risk of pre-ignition than if the valves were a considerable distance apart, say, at opposite diameters of the combustion chamber, for the reason that the gas is drawn direct down into the cylinder before it has time to come in contact with the hot valve or exhaust residue.

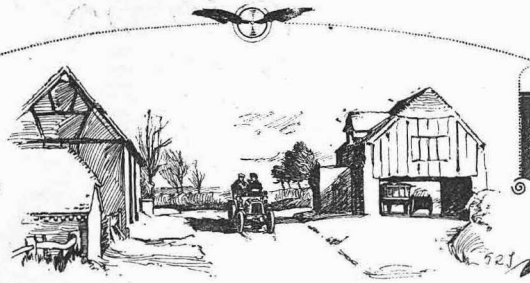
### Ignition Caused by Carbon Deposits.

Excess of lubrication in time causes a crust of carbon on top of the piston and around the walls of the combustion chamber. But a larger quantity seems to form on the piston. This deposit may become incandescent in parts and fire the charge. It is very often found that a motor will run for some little time after the spark has been switched off. I had a front-driving motor-bicycle some years ago that would run for several miles at top speed with the spark switched off, and I could only stop it with the throttle. I attributed this, however, to soot on the spark-plug through using too rich a charge. Pre-ignition will often occur when running an air-cooled engine at a very high speed. If it occurs very early in the stroke the drag on the engine (and sometimes even a jerk) is very pronounced.

### Inefficient Rear-lights on Cars.

As to the utter inefficiency of the majority of rear lamps for lighting up the number-plates of cars there can, I think, hardly be two opinions. About one car in every 10 that pass on the road has a good enough light to enable one to decipher the number at a dozen yards. There is usually a wretched glimmer; the lamp is tilted upwards, and the red glass is kept in a dirty condition and obscured. It seems to me that many drivers look upon the fitting of a rear light as an intolerable nuisance and consequently use the cheapest thing they can get. In fact, I have actually seen in use a common rear lamp, sold at 2s. 6d. and made for fitting to an ordinary bicycle. This is surely a mistaken policy. Decent, properly-constructed lamps are to be bought; but they are more expensive than the bicycle lamp at 2s. 6d. If a driver using one of these lamps gets stopped and fined on account of his light being out he can hardly call it bad luck. A good lamp should be used, fitted to show up the number properly and kept clean and well trimmed. The driver with an indistinct rear number is very liable to do his brother motorists a serious injustice. Suppose his number be taken for some alleged offence by the rural policeman. The latter is just as likely to read 1 for 7, or vice versa, and the wrong man gets the summons. With respect to rear-lights being shaken out by vibration on rough roads and the driver being unaware of it, why cannot the manufacturers fit some little device to the lamp to warn the driver that his light has jolted out? I could think of two or three ways of doing it—one being a small mirror or prism on the top of the lamp and another little mirror on the top rail of the car. A glance at this would show at once if the lamp was alight; or the ray could be projected right on to the dashboard, so that the driver need not even look around. Something of this sort is badly wanted.

## CYCLOMOT'S



## CAUSERIE

**me Useful Advice.**

One of the advantages of referring to one's plans for an alteration or improvement before finally putting them into operation is that an opportunity is afforded to kindly-disposed readers to criticise them and suggest something better. A couple of weeks ago I mentioned the rough pattern apron of canvas which I had fitted under the engine and gear of the car to protect them from the dust and mud which are thrown up by the front wheels, and I hinted that, if the pattern proved effective, I should proceed to make a permanent apron of Willesden canvas. Since publicity was given to that intention quite a number of readers have been kind enough to write and give me suggestions on the subject, and for some days I was rather bewildered. More than one recommended me to make my screen of leather because it would not be affected by oil. One told me not to have leather or canvas because neither would be improved by water, whilst both get into a nasty mess with the oil that exudes from the gear box: he recommended a tarpaulin canvas. Another touched upon the uses of various substances, and warned me to avoid anything such as light canvas or tarred fabric because if, by chance, they caught fire they would flare up instantly! He urged the advisability of using sheet iron. Yet another said, don't use iron because it is in a constant tremor and the noise is incessant: use sheet zinc felted at all points of contact. My friend Mr. Mervyn O'Gorman then came along with his suggestion of vulcanised fibre sheet of about 30 gauge. He had employed this substance in making the aprons of a couple of cars and was quite pleased with it. For a while I was very doubtful, but at last narrowed the choice down to Willesden canvas, as I had at first proposed, sheet zinc, and vulcanised fibre. All three were easy to work, whilst each had its advantages and only one or two disadvantages.

In the meantime I had noticed the behaviour of the light canvas pattern. In the course of but a three miles' drive it had, despite all my precautions, got blown against the hot exhaust pipe, and there was a hole with scorched edges nearly a foot long. This was ominous, and it suggested the need for additional brass stretchers, in order to reduce the lengths of the unsupported sections. Thereafter, I watched that burned place rather narrowly, but, curiously enough, although the canvas has been in use for over 150 miles the burnt area has not increased. But the oil-soddened canvas displeased me very much. True, in my gear-case, in the case covering the bevel pinions, and in the differential case I have used copious libations of oil in order to help the new pinions, and so an unusual amount of exudation has taken place. The consequence has been that the bottom of the canvas is covered with a nasty, slimy mess, which is held by the canvas and does not drain away to the one outlet which I had provided. These two experiences eliminated canvas from the list of selected candidates, and, because I thought that zinc was not entirely free from suspicion of noise, I finally took Mr. O'Gorman's advice and bought a couple of pieces of sheet fibre (cost 6s.), and have now made the apron and fitted it in position.

As the material lacked the flexibility of canvas, I had to make up the fibre apron in two pieces—one the sloping front from the framework of the car to the first under-stretcher below the engine, and the other which goes under

the gear from the first to the last stretcher and from side to side. Small brass plates have been riveted all round the upper edge of the apron, and in these inverted keyhole slots have been cut. Screws fastened into the framework serve to engage with the keyhole slots, and on these the two parts of the apron depend. Small eyes have been punched along the lower edge of the front apron and along the two ends of the rear part, and some 8-shaped eyes have been attached to the brass tubing stretchers, which are encircled by the upper loops of the 8's, the lower loops passing through the eyes in the apron. Then a leather thong, fastened at one end to the frame of the car, passes right through the whole of the loops of the 8's, and so keep the apron taut up to the stretcher. At the extreme lowest point I have punched a sort of strainer, which will allow oil or water to drip through, but will arrest any stray bolts or nuts that may come adrift. At present everything looks nice and pretty, because the car has not been out since the apron was completed, but I imagine that any accumulation of oil can be swilled away with a drop of stale petrol without the fibre getting saturated and distorted. Anyway, I shall always be able to strain it tighter, because the keyhole slots have been placed fairly low down, so that by shifting the screws up, say, half an inch, at any time, the apron could be pulled quite taut again.

**A Useful Material.**

I rather like this thin sheet fibre that I used for the apron, for, being non absorbent of oil or water (although, by the way, when wet it is not a good electrical insulator), and being easily workable whilst also being fairly stiff, it ought to prove of considerable use. One device I have already made of it—and that is an oil arrester over the forward protruding end of the crank shaft. Oil used to creep out along the bearing, and, getting on to the collar with which the starting handle engages, used to get itself thrown, in a pure sporting spirit, in a sort of fine spray over the cover of the contact breaker and on to the doors of the bonnet. That little game I have spoiled by interposing a small sheet of fibre just in the line of fire and right down close to the end of the shaft, a couple of bolts and nuts being most conveniently situated for fastening it by. Now the oil can bespatter the underside of the shield as much as it likes, and one more source of dirt is avoided. The fly-wheel, too, is imbued with much the same sort of spirit, loving to spray oil, which it collects from the inner crank case bearing, over the forward side of the dashboard and everything else within reach. I had prevented this, to a certain extent, by a washer and by the use of a thick grease crammed into the bearing. However, a shield over the fly-wheel will put an end to the trouble. The fibre makes capital washers, and I have found it to answer a purpose for which leather had failed—namely, making a small washer with a large hole in it, so that there is but the narrowest rim of material left, for my tyre inflator. Some good washers for the valve bodies and locking screws of the tyres have been made: they serve the double purpose of preventing the fly-nuts from jarring loose with the vibration, and they will prevent the ingress of wet through the holes in the rim. No doubt—knowing my propensity for experimenting—other uses will be found for the material as time goes on.

## THE STANLEY SHOW: SOME FURTHER NOVELTIES.

As we stated in our last issue we were unable to include all the Novelties in our Show report, bulky as it was; we therefore continue our description, although, even now, we are obliged to omit reference to several interesting exhibits, but we hope to make amends in a later number.

Salsbury's folding bucket is a very useful accessory for car work; it can be folded down quite flat and then doubled in half, thus occupying but a small space. When opened the top and bottom rings and the side struts make it quite rigid.

The Sphinx Mica plug replacement is for replacing the usual type of porcelain centre by one of mica; it is shaped upon the De Dion pattern and will fit that plug. The Sphinx Manufacturing Co., of Birmingham, are intending to make these to fit the majority of standard type ignition plugs.

The Crypto Electrical Engineering Co., 3, Tyers Gateway, Bermondsey, London, S.E., showed specialities in accumulator charging dynamos and switch-boards of first-rate workmanship. A notable exhibit was a rotary transformer for converting an alternating to a continuous current. Test lamps and other small exhibits made an interesting display.

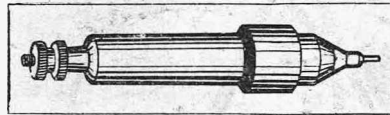
Brooks' tri-car seat is a new production of the well-known Birmingham house, and is well adapted for the purpose in view. The double springs are those so successfully used in their Bioo motor saddle,

The 20th Century Lamp Co., Ltd., 114, Fore Street, London, E.C., are marketing an acetylene lamp with seven hours' capacity. It is in two parts, a generator



Salsbury's Folding Bucket.

and lamp, each of which can be supplied with any type of bracket for fixing to any part of the frame. The carbide reservoir has a thin brass wall, which can be piled

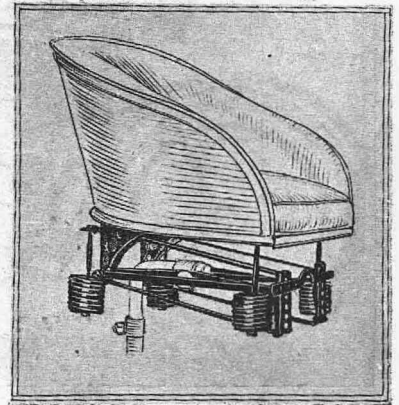


The Sphinx Mica Plug Replacement.

to free the attached carbide. A car lamp, with separate generator, wherein the carbide is retained in a linen bag, is also one of the specialities of this firm. India-rubber tubing is preferably used for the connection. Besides lamps, force-feed oilers are displayed, which form a novelty for this firm.

The Reliance Works Company, of Southampton, showed two contrivances of extreme interest. The first is the N.A.B. seat pillar (National Anti-vibration Balls) which has balls right down the plunger, breaking up the friction at any point of contact. A handle-bar on the same principle is also shown. The second novelty is an adjustable seat and handle-bar for adding a second seat to a motor-bicycle.

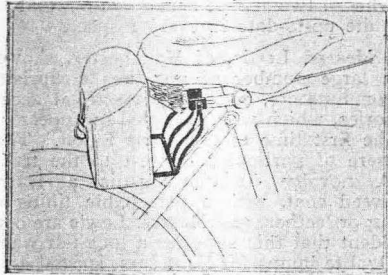
The Simms' Manufacturing Company, Welbeck Works, Kimberley Road, Kilburn, N.W., exhibited their arc-light magneto ignition set fitted to a variety of motors of their own manufacture. The arc-light magneto ignition has been developed to a high degree of perfection, and is far ahead of the old low tension magneto having a reciprocating drive and mechanical spark-plug. It gives a high tension current just the same as a coil does, and has a smooth rotary drive. The motors shown range from a four-cylinder 30 h.p. down to a 2½ h.p. air-cooled type for a bicycle. These motors have mechanically operated inlet valves, and are



Brooks' Tri-car Seat.

splendidly designed and finished throughout. A 1905 Clyde motor-bicycle fitted with the Simms' 3 h.p. engine and magneto is shown. The 4 h.p. engine is of the water-cooled type.

F. Reddaway and Co., Ltd.—Camel tyres are already well known, but this year the motor and motorcycle tyres possess a distinct improvement in the combination of endless wires and beaded edges. The tyres are practically beaded-edge ones, each bead having an endless wire located in its centre. Some of the layers of canvas pass round the wires, and some form the bead. The strain is thus equally divided, and the beads never break away. This firm is also marketing a tubeless tyre made on the same principle, the rubber-lined inner faces of the tyre near the beads being compressed against a trough-shaped inner ring made of metal by means of a divided rim, the two parts of which are connected by a number of nuts and bolts. Tyres mounted on these divided rims can be lifted off by hand as soon as the nuts are undone.

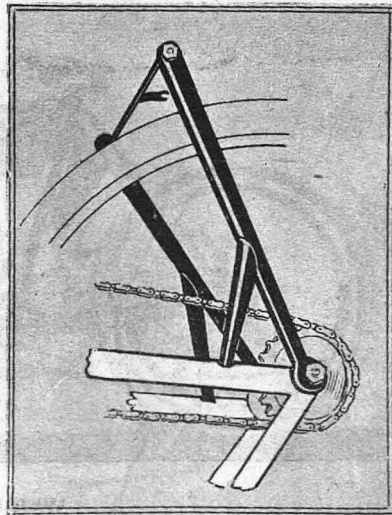


The Triumph Tool-bag Carrier.

and are compound in their action, the internal spring being under compression, and the external in compression. The seat fits upon the usual rear saddle pillar, and is adjustable fore and aft and vertically.

To meet the demand for a resilient solid rubber tyre the Reilloc Tyre Co., of St. Albans, have introduced one which they claim possesses this quality. A third of the weight of the ordinary solid tyre has been saved by a specially designed drum, which takes the tyre bearing between an inner C face and an outer circumferential plate, which is bolted to the rim. These tyres are made in all sizes, from heavy motorcars to the very lightest.

We illustrate two good things the Triumph Cycle Co., Coventry, are fitting to their motor-bicycles; the jack, when out of use, is swung up over the mud-guard, and can be quickly dropped when desired. The tool-bag carrier is designed to take the weight of the bag and contents off the usual slots at the rear of the saddle and, as will be seen, the object is cleverly attained, the carrier being attached to the strongest portion of the saddle framing; swaying and rattling of the tool kit is also prevented.

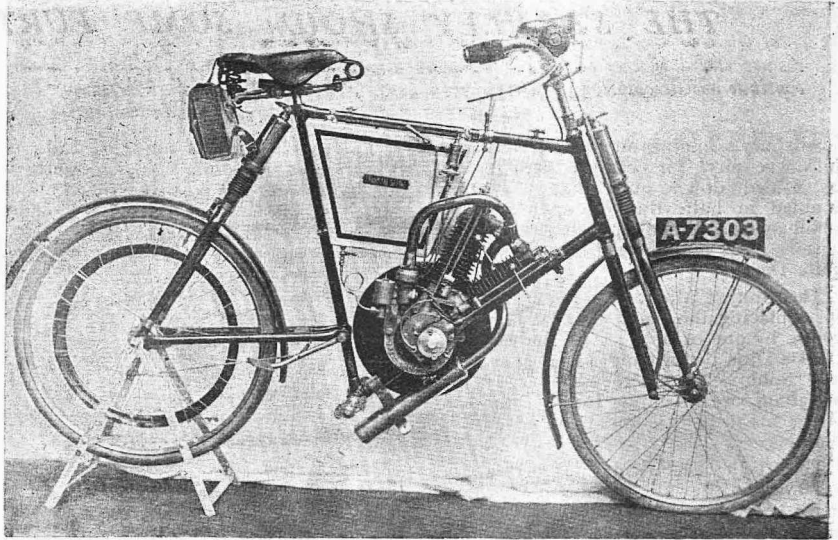


The Triumph Motor-bicycle Stand.

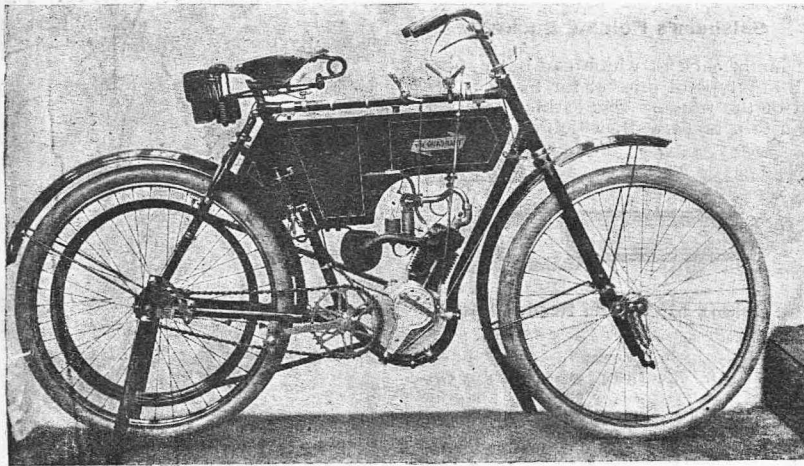
**Further Show Novelties.**

The Sharp Air Spring Co., 15, Bridge Street, Hammersmith, showed specialities in vibrationless motor-bicycles and tri-cars. On the bicycles the air spring is contained in a small cylinder in front of the steering stem and between the back forks and diagonal, both wheels in fact being pivoted. The use of the air springs enables much smaller wheels and tyres than usually fitted to be adopted. There were two motor-bicycles shown, both light-weight; one has a 2 h.p. Clement engine and scales 75lb. and the other a 3 h.p. Clement engine and scales 103lb. There are no pedals fitted on this machine.

The Quadrant Cycle Co., Sheepcote Street, Birmingham, have brought the weight of their 2 h.p. machine down to 98lb., or, if spring forks are fitted, to 103lb. The outline of the machine has been considerably improved, and altogether it is a very handy and symmetrical mount. The engine is fitted



**Sharp Light-weight motor-bicycle with air springs.**



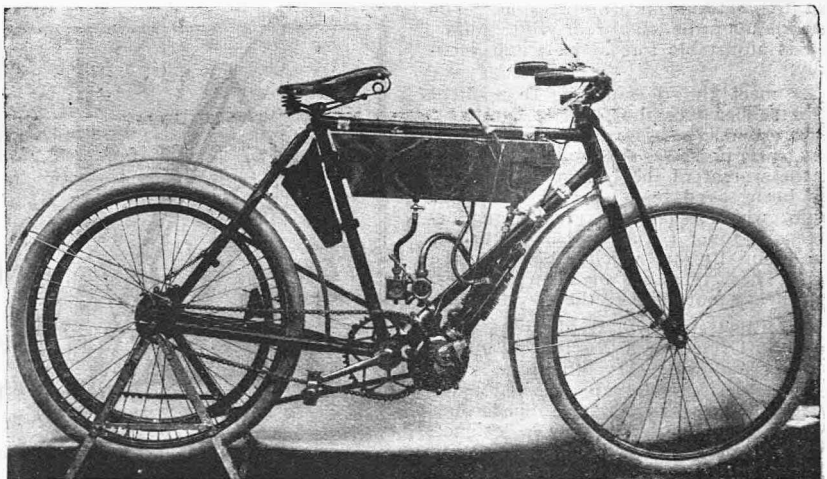
**The Quadrant Light-weight.**

in a loop frame, and a spray carburetter is now fitted. The design of the tank has been improved and accessibility of all details carefully thought out. Two brakes are fitted, viz., a band brake and rim brake, on rear wheel. The engine is amply powerful enough for a medium-weight rider, and even severe hills can be surmounted at a good pace. The reliability and finish of the Quadrant machines is so well known that there is no need for comment on the matter.

Brown Bros., Ltd.—Several motorcycles were shown by this firm. The one to which most attention was attracted is an all English machine of 3 h.p. (80mm. by 80mm.), with M.O.V., having a For-man engine, E.I.C. commutator, E.I.C. trembler coil, Bowden exhaust valve lifter, Bowden back brake, Brown and Barlow carburetter, and 4in. mudguards. Any English tyres are fitted to suit customers' wishes. These machines are very carefully made, the frames are reinforced at all vital parts, the front fork is triply strengthened by the extension of the forks upwards, and a pair of gilder tubes. The

belt rim is attached direct to tyre rim by double tangent spokes. This firm, for a small extra charge, will fit a free engine clutch, an illustration of which is shown. Two other machines are shown, 2½ h.p. and 3½ h.p., but these are not entirely English, having Longuemare carburetters. All the machines have extra large fly-wheels, two sets of accumulators, and are quite up-to-date in every respect.

Messrs. Lewis, of Manchester, showed a large number of novelties comprising commutators, and other electrical accessories, which were intended to appear for the first time at the Paris Salon. They were of particular interest to the trade. A novelty in clothing is a Harris tweed coat, with a detachable lining of fur or leather, and Messrs. Lewis are confident that this supplies a long-felt want. Ovalite lamps for light cars, special anti-vibratory base lamps, double-acting air pumps, and handsome patent number plates and other accessories formed part of this exhibit.



**WEIGHT 58 lbs.**

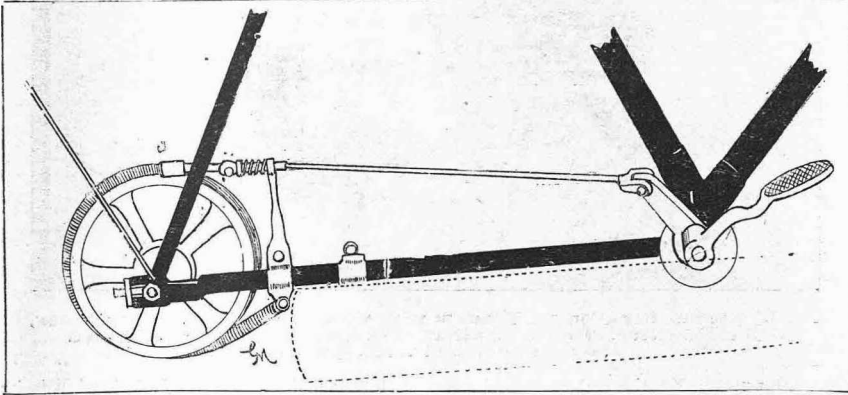
**The Ascott Light-weight (described on page 432, last week's issue).**



**Further Show Novelties.**

A very interesting display of electric ignition accessories was that of Messrs. Cohen Bros., 6, Bank Parade, Kensington Station. These included accumula-

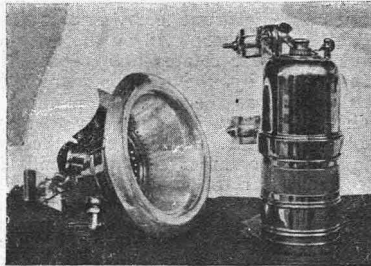
speciality was shown in one, two, three, and four-cylinder coils worked from one trembler. Each coil is built up separately in its own damp-proof case, and it can be readily removed without disturbing any connection. The trembler itself is mounted on a separate vulcanite base, quickly detachable for adjustment or repair.



**The Phoenix pedal operated fibre band brake. This was described in last week's issue (page 432).**

Messrs. J. E. Hutton, Ltd., Thames Ditton, were unable to get their stand complete for the opening day, but later on staged a capital exhibit of Princeps motorcycles. Several twin-cylinder air and water cooled engines were shown, these being rated at 5 h.p. Several new features have been introduced, amongst which is an adjustable inlet valve and improved contact breaker. Both chain and V belt transmission are adopted on different models. A well-finished 2½ h.p. touring machine attracted much attention. Probably the most interesting of the Princeps exhibits proved to be the two-speed gear. This is a remarkably simple device, and consists only of two chain sprockets and a very cleverly thought out claw clutch. The whole thing is very compact and well protected by a metal sleeve, and looks like an ordinary countershaft. This gear is applied to the new Princeps fore-carriage—an excellently designed little vehicle at £75.

tors of different sizes, coils for single and multiple cylinder engines, auto tremblers, Magneto's ammeter and voltmeters, all of excellent quality. A

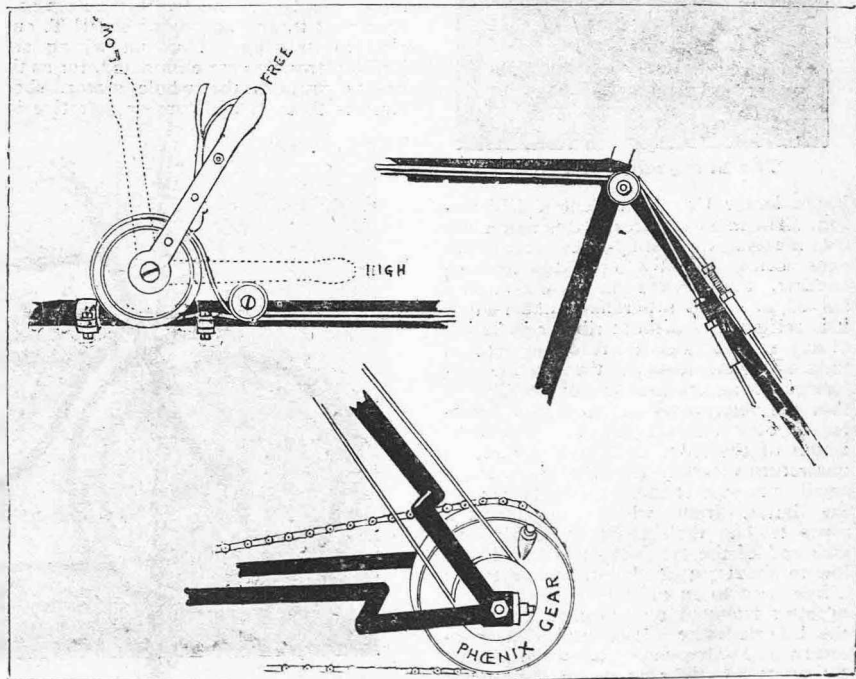


**20th Century Acetylene Headlight, with separate generator.**

Regal Motor Car and Launch Co., Ltd., 66, Great Russell Street, London, W.C., staged three cars; they have models at all prices from the modest two-seater to the heavy touring car. The smallest is a 6 h.p. light car, with De Dion engine and carburetter, high-tension ignition, and two speeds and reverse. A tubular frame carries a Roi de Belge body. The control levers are on the steering column, and change speed lever is at side of car, together with the brake lever. The drive is by a cardan shaft to the rear live axle. Price 135 guineas. The next model is a 12-14 h.p., with two-cylinder Aster engine. M.O.V. or automatic valves are fitted to order. Ignition is high-tension, with wipe contact; water-circulation is maintained by a pump through a nest of gilled tube radiators, the tank being carried upon the front of the dashboard. Lubrication is effected by a hand pump with three-way tap to engine, gear-case, and differential, and there are three speeds and a reverse (changed by side lever), conveying the power to the live axle by a cardan shaft. The price, with tonneau body, is 300 guineas. They also showed a splendid specimen of the landaulette type of body (by Barker and Co.) and driven by a four-cylinder 20 h.p. Brouhot engine.

The well-known Michelin motor and motorcycle tyres, famous in races for their great speed qualities, were exhibited in great variety. All types of tyres are made with flat non-slipping thick tread or smooth tread. One tyre calls for particular attention. It is intended for use on tri-cars, but is made in a similar manner to a voiturette tyre with canvas, and it is stocked in two sizes, viz., 3in. and 3½in., has beaded edges, and is secured by bolts. The motorcycle tyres proper are made with a fabric lining, and have either wired or beaded edges. Double butted ended tubes, the one end being conical and the other end being a hollow cone, are very neat and form a feature to be seen. There was also on view a large selection of tyre levers and various accessories for use with tyres. The company does not forget to call attention to the fact that the winner of the Gordon-Bennett race this year used Michelin tyres, and they are presenting a very excellent illustration of M. Thery, on his car, and one of Mr. Heath (winner of the Vanderbilt Cup) to all applicants.

The aluminium rectifier for charging up accumulators from an alternating current supply was an object of much interest. This is a very simple contrivance, and can be arranged by any one. There are no mechanical parts about the system. Messrs. Stuart, Livett and Co., Theobalds Road, London, market this device at a very reasonable figure, and as many electrical supplies are alternating instead of continuous it should be well appreciated.



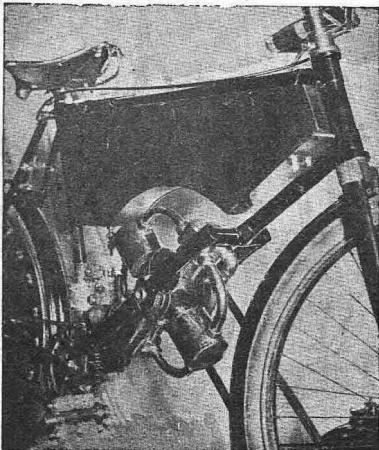
**Phoenix Two-speed Gear and Operating Mechanism. See page 432, last week's issue, for description.**

### Further Show Novelties.

Fastnut, Ltd., 60, Aldermanbury, London, E.C., exhibited a very clever little invention in the shape of a locking washer. This is simply slipped over the bolt and the nut screwed down on it, when it is held perfectly secure and no amount of vibration can start the nut loosening. With the application of the spanner the nut comes off in the ordinary manner. It suits both hexagon and square nuts. It is much simpler than a lock-nut.

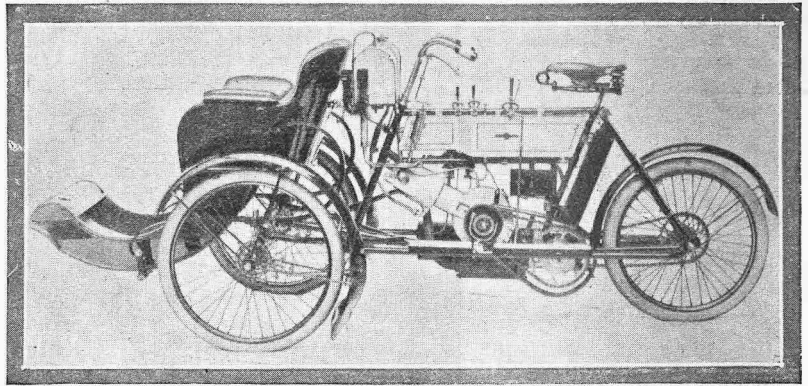
Clissold Cycle Co., 77, Green Lanes, N., had two motor-bicycles arranged to display their special safety fitment for preventing side-slip. Two small rubber-covered wheels are carried on a horizontal arm, which can be lifted clear of the ground or kept in contact with the road as may be desired. The engine can be started up as upon an ordinary jack, and by twisting a pair of grips at either end of the handle-bar the safety wheels can be locked in the position desired.

The most original design of engine in the entire exhibit of bicycle motors—in fact the most radical novelty that has been introduced since internal combustion motors were first manufactured, is the 4 h.p. revolving motor shown by the



The Barry motor-bicycle.

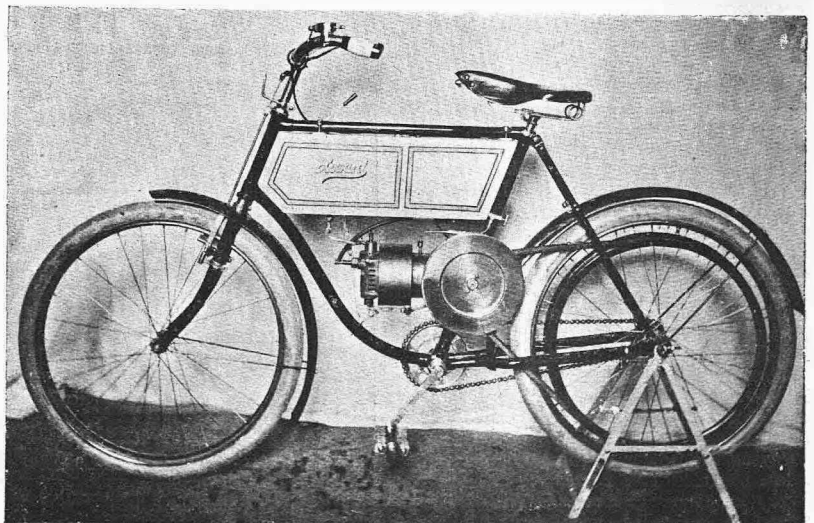
Barry Motor Co., Ton Pentre, Glamorgan. The main features of this motor are that it acts as its own fly-wheel—the cylinders being directly opposed to one another, and united in a diagonally-halved, and gas-tight crank-chamber—that it is self-cooling without ribs or jacketing of any sort, because its revolving motion induces a sharp draught through the perforated casing in which it is enclosed; and that the mixture is automatically forced to each cylinder by the combined action of the front ends of the pistons, non-return valves in the crank-case, and a small pressure-chamber connected with the latter, from which the induction pipes lead to their respective cylinders. One end of the crank-shaft is bored hollow to about  $\frac{3}{4}$  in. diameter, and united in a free joint to an ordinary float-feed carburetter mounted on the central stay of the bicycle-frame. It contains a non-return A.O. valve, so that when the pistons fly apart on their in-stroke they draw enough mixture for two charges into the crank-chamber. These two charges are



The 4 h.p. Humber Olympia Tandem with water-cooling, two-speed gear, and chain-drive. This is an alternative type to the one illustrated and described last week (page 424).

next compressed on the out-stroke of the pistons, and forced through a second non-return A.O. valve into the pressure reservoir (at right-angles to the shaft and cylinders, but in the same plane as the latter) ready to be admitted to either cylinder as one or other M.O. inlet opens. Both inlet and exhaust-valves of each cylinder are mechanically operated from the usual double cam on the short sleeve which carries the half-time gear, and is itself mounted on a short stud on the cylinder. Thus each gear rotates upon, instead of being driven by, the smaller gear on the crank-shaft; as the combustion effort in each cylinder acts centrifugally to rotate the whole motor. Furthermore, the ignition in each cylinder is automatically induced by the rotation of the motor; that is to say, there is no commutator other than an insulated strip of metal mounted in the casing in electrical connection with the usual contact-breaker on the other end of the shaft; a short leaf spring from each sparking-plug—which is inserted in much the usual situation—making momentary contact with the strip as it runs past it, and conveying the H.T. current to its plug. Thus all wiring and ignition troubles are eliminated, for as the casing protects the whole motor, short circuits through moisture or defective in-

sulation is impossible. Lubrication is by gravity-feed through the end of the crank-shaft, which is bored out into the crank-arms, pins and journals, with the usual leads and cross borings. The exhaust from each cylinder is led into a common silencing chamber, opposite to, and of the same size and weight as, the storage chamber. The weight of the whole motor is 15 lb. only, or  $3\frac{1}{2}$  lb. per b.h.p., and it is claimed that the whole arrangement can be duplicated or triplicated for motors of larger size and power. Where it is desirable, as in a boat installation, to keep the shaft axis low, short-stroke cylinders may be mounted. And, owing to the whole of the power being stored, fly-wheel fashion, by the centrifugal effort of each cylinder mass during successive working strokes, no vibration—which is merely the outcome of lost energy—can possibly occur. This result, too, may be somewhat assisted by the cushioning effect of the crank-case compression; which last also prevents condensation, no matter how low the temperature induced around the motor, because the charge is alternately maintained in tension and compression. Altogether, the Barry motor is the most essentially original, simple and apparently efficient product of the modern motor industry.



Mason and Brown's light-weight motor-bicycle fitted with Howard's patent 2 h.p. horizontal engine. It was fully described in last week's issue (page 432). It only weighs 75 lbs.

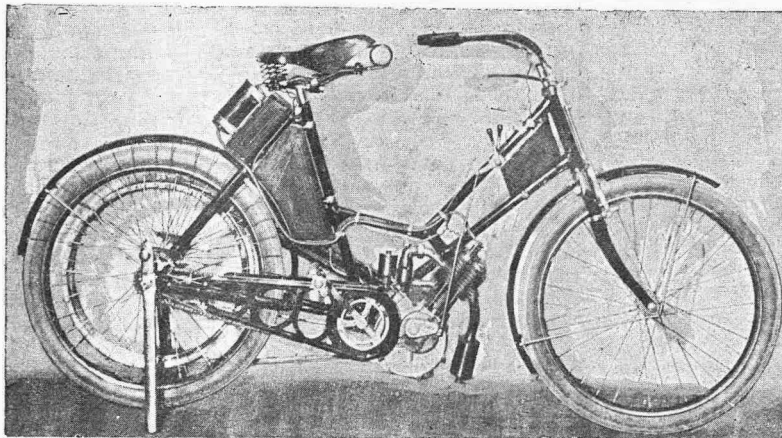
### Further Show Novelties.

Minerva Motors, Ltd., had a lady's motor-bicycle on show. It has a 2 h.p. engine clamped on to the main down tube. The upper part of the frame is of the drop pattern, well stayed. The drive is by V belt. The petrol tank, accumulator, and coil are fixed in the rear part of the frame. The control levers are fixed near the head. A spray carburetter is used.

Messrs. Fuller and Sons, of Wick Lane, Bow, E., were unable, through great pressure of business to arrange for a separate stand at the Show, but most of their well-known electric ignition accessories were to be found on various stands throughout the Show. Messrs. Brown Bros. showed the Fuller coils. The Midget pattern has been further improved as regards the trembler, which is now made more substantial and easier of adjustment. The Fuller accumulators were also shown.

The East London Rubber Co.—A very large display of accessories was exhibited by this firm, including a petrol funnel with filter, and a neat enclosed centrifugal fan for motorcycles. Kerry lamps

and is made of specially toughened rubber. A grey rubber car tyre, the Moseley, having an inner tube, was also displayed. It has also the same square thick

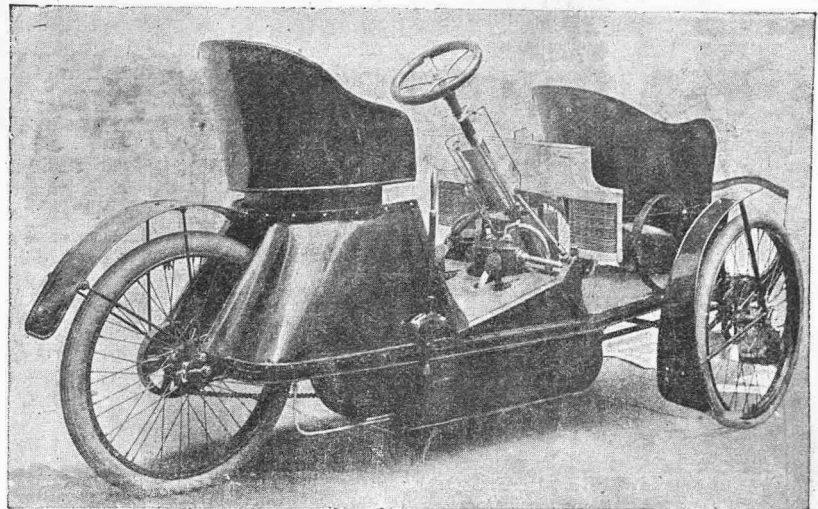


The Minerva motor-bicycle for ladies.

are a speciality—head, tail, and side lights; pumps, radiators, and every imaginable accessory were on view; and it is also worthy of note that the Kerry Co. are now pushing the Fuller electrical specialities. A new back-peddalling band-brake for motorcycles was shown, fitted to the firm's 5-horse twin-cylinder machine.

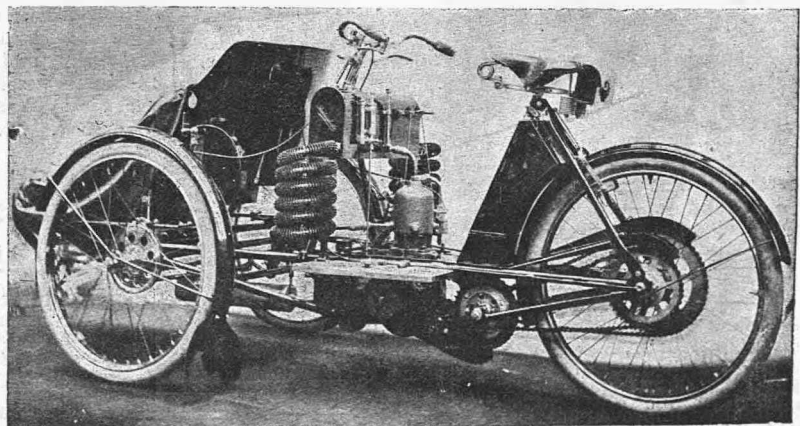
Moseley and Sons, Ltd., Ardwick, Manchester.—This firm manufactures the Moseley and Ardwick motorcycle tyres with both beaded and wired edges, the former being the better quality; the latter is cheaper but also of high quality. The celebrated Flexifort fabric is used in both these tyres and ensures resiliency. The Seddon red tubeless tyre for cars, made by this firm, is particularly interesting. The outer cover is lined with grey rubber and has a rib on one of its edges which fits into a groove on the other edge, the two edges being clamped tightly together by the removable side of the rim, which is secured by bolts and nuts. Should a puncture occur an air tube may be placed in the cover for temporary use. The tyre has a square tread

running tread. The air tubes made without a join which have a normal tendency to assume a circular form in cross section have been improved.



The Revolette.

The Revolette is a new fore-car embodying some distinctly novel features. It has just been introduced by the New Revolution Cycle Co., Birmingham. The chassis is built up from channel steel like a car, and well stayed. The engine is 89 x 95 mm. water-cooled. Transmission is by chain from engine sprocket to a friction-clutch and thence through the gear-box to rear wheel by chain. The whole of the gearing is boxed in by a metal apron and is thus thoroughly well-protected from the weather. There are three powerful band brakes acting on grooved drums. The driver's seat is specially sprung on a quadruple set of springs cased in, and a roomy box is fitted under the seat. Steering is on the wheel and inclined pillar principle. The speed-changing levers are on the right, and engine control on the steering pillar. The brakes are operated by pedals. A footboard mounted on springs minimises road shocks being transmitted. A good feature is the amount of room for the driver, provided between the seat and fore-carriage. The wheels are 28in., fitted with Clincher tyres. The water and petrol capacity are sufficient for lengthy runs, and special attention has been paid to the provision of efficient guards, well-stayed to withstand vibration. Price £70.



The Raleighette (described in last week's issue, page 427).



**The Motor**  
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**OPINION**

### **The Stanley Show and its Lessons.**

The Stanley Show, on which the curtain was rung down on Saturday last, was in every respect an unqualified success. Packed with exhibits abounding in interest, it drew for over a week record crowds so far as the Agricultural Hall is concerned. Although in its essence a cycle show, it was permeated with motor exhibits to such an extent that it is exceedingly doubtful if, after all, the automobile section did not form the principal source of attraction. On all sides in the main hall were splendid specimens of car-like tri-cars and light and heavy motor-bicycles, and in the several annexes more vehicles of this type and also a number of well-designed cars were on view, whilst in the galleries the visitors were almost confused by the wealth of automobile accessories displayed. Every day the greatest interest was evinced in all things appertaining to the motor, and from the intelligent questions put to the stand attendants it is abundantly evident that the public are fast becoming educated in the ethics of automobilism; the inane querist was the exception rather than the rule, a fact that astonished as well as gratified the exhibitors. The exhibition was beyond all doubt yet another demonstration of the steady growth of automobilism in this country, and the extraordinary interest which was centred in the sociable form of vehicles, like the tri-car and the two-seated car, affords a true indication to the way in which the public lean in the matter of preference. All this is very satisfactory, but it is equally satisfactory to know that the Stanley Show was productive of something more than mere interest. It proved an emporium of really good business, the majority of the manufacturers being exceedingly pleased with the result of the week's trading.

### **The Development of the Light Car.**

We must confess to having listened with feelings very much mingled to the reading of Mr. W. W. Beaumont's paper upon this subject before the members of the Automobile Club last Thursday. There was wonderful scope for dealing with the subject from the points of view of the purchaser on the one hand and of the maker on the other. The public could have had pointed out to them with absolute impartiality, with fearless criticism and unstinted praise, the good and bad points of the various types of light car now on the market, and given many valuable hints upon the use and the methods to avoid the abuse of the little car. Makers could have had pointed out to them the points where alteration or improvement would be desirable: they could have had the benefit of the light of a scientific reasoning

thrown upon their methods with a view to some good practical benefit accruing therefrom. But missing all of these opportunities, Mr. Beaumont chose to treat his subject from the standpoint of deep and scientific analysis—in a manner which was practically over the heads of his audience, and which would have been better suited to a gathering of one of the learned societies. Had Mr. Beaumont entitled his paper "The Scientific Aspect of the Light Car," there would have been no cause for complaint, because his audience would have gone prepared to argue the matter with the author from the same platform, and there would have been left an opening for a paper which would speak of the advantages of the light car, and which, by recounting experiences and indicating spheres of usefulness, would appeal to and impress the public very forcibly. As it was, speaker after speaker rose and admitted their reluctance to discuss the paper because the author had practically taken them out of their depths. On the other hand, let us freely admit that Mr. Beaumont's contribution was a monument of thoughtfulness and deep consideration, and that, hidden amongst the weight of massive material, were some gems that, if taken to heart by designers and constructors, will tend towards the improvement and hasten the development of the light car.

### **Accessibility of Parts on Small Cars, etc.**

One of the most desirable features on a car is ready accessibility of all parts likely to require attention. Yet there are many otherwise excellent little cars in which this one feature is lacking. When on the road and it is necessary to get at a part quickly, nothing is more annoying than to find, for instance, that the particular nut you wish to unfasten can only be moved an eighth of a turn before it is necessary to move the spanner to another position to give it another part of a turn. This usually results in the loss of time and temper. A little extra attention on the part of the designer can usually obviate these little difficulties. Carburettor and contact fittings especially should be in a very get-at-able position. On some cars the accumulators are stored right away at the back of a cupboard under the seats, and secured by clamps, rendering it quite a business to remove the cells. It should not be difficult to improve on this arrangement, such as by having a case under the foot-board to simply drop the accumulators in. The cover of this box would be flush with the foot-board, and it could be got at in a few seconds. There is also the matter of interchangeability of parts, and the stocking of complete sets of these by the makers and agents. In many instances very annoying delays occur in getting simple parts, especially of foreign-made cars, and often the parts are not a dead fit with the old one. Whether an agent handles British or foreign built cars, we think he should be able to meet a customer's requirements from stock. Also, if the example of one or two French and German firms were generally followed in the direction of including in their illustrated catalogues a complete list of parts, and with each part illustrated, named, numbered, and priced, it would greatly help the customer and dealer. There are instances frequently occurring of customers wanting parts, and, not knowing the exact technical term for them; they send on a general description, with the result that they get something sent which is quite different to what they want. This leads to most annoying delays, which could be obviated by having a properly illustrated list of parts to quote from.

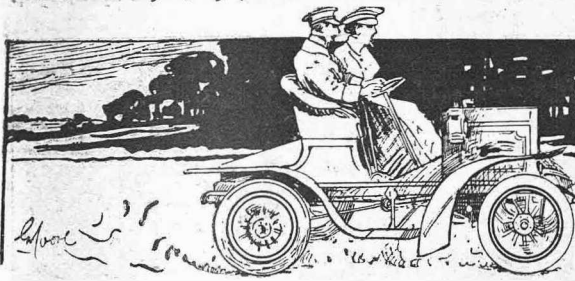
### **LIGHT CARS AT A GLANCE**

*This is the title of a useful little book of reference which we have prepared. The salient features of every light car known to us are given and the booklet will be found of service to those who want to compare the points of one car with those of another.*

#### **The Book is Free**

*to applicants who send an addressed stamped envelope.*





# NEWS

### The Paris Show.

This great Automobile Exhibition opens on December 9th.

"THE MOTOR" will be the first journal in this country with a fully illustrated report.

The French Automobile Club is approaching automobile clubs of other countries with a view to offering a substantial sum of money as a reward for the detection of "nail-strewing" miscreants.

The French motorcyclist, Baron, who is touring France on a motor-bicycle, had a very trying experience last week in the French Alpine district, the average of the gradients for several miles being 1 in 10.

As the page was on the press we noticed that the block of the illustration of the Triumph motor-bicycle stand, which appears on page 463, was upside-down. Unfortunately it was too late to effect an alteration.

Last week's cold snap had one good effect from the motorist's point of view: it checked the flow of wit from the street urchin's mouth, for even he realised the absurdity of jeering at an individual who was about the only sensibly clothed individual in the community.

After a lengthy hearing the magistrates at Maidenhead, on Saturday, came to the conclusion that there was not a prima-facie case to send for trial in the matter of Stanley Noble, who was committed for trial on the coroner's warrant for killing a boy.

A Southampton motorist has been fined £5 and costs for driving in a manner dangerous to the public. In the course of the case an argument as to the responsibility of a driver who was on the wrong side of the road arose. Counsel for defence pleaded that it did not necessarily constitute negligence.

The motor lifeboat which the Royal National Lifeboat Institution have recently fitted up left the Isle of Wight for Newhaven, on the 15th inst., under the charge of Captain Nepean, R.N., chief inspector. The passage was made without a single stop, the whole distance of 50 miles being covered in 7½ hours. The lifeboat will be stationed at Newhaven during the winter, and her performances on service will be watched with the greatest interest.

Maurice Fournier, the French motorist, started recently from Paris in an Oldsmobile car on a tour through Europe. Two thousand five hundred miles will be covered, the route lying through Bordeaux, Marseilles, Genoa, Rome, Venice, Budapest, Vienna, Dresden, Berlin, Hamburg, Amsterdam, Brussels, and back to Paris. Fournier expects to complete the trip in three weeks. A wager of £4,000 is said to hang on the result. The English mechanic Ashley accompanies him.

### Coming Events.

- Nov. 30 Auto-Cycle Club's Annual Dinner.
- Dec. 5 to Jan. 15. Exhibition of Engines for Motor Boats and Airships, and Heavy Automobiles; also special prominence to devices for alcohol consumption (Cours de la Reine Conservatoires, Paris).
- " 9 to 26. Paris Automobile Salon.
- " 10. Annual dinner of the Motor Cycling Club at Frascati's. Mr. S. E. Edge in the chair.
- " 26. to Jan. 2. Motor Union of Western India Reliability Trial.
- " 31. Entries close for 1905 Gordon-Bennett Contest.

### "Cycling's" Smoker.

"Cycling's" Bohemian Concert at the Queen's Hall, Langham Place, W., on Friday evening last, was a triumphant success, over 2,000 clubmen and friends being present. A high-class entertainment was provided, and the utmost enthusiasm reigned during the entire evening. Mr. Edmund Dangerfield, who presided, presented a handsome silver shield to the Pioneer C.C., the winners of the "Cycling" Club Run Attendance Competition. It was announced that a similar re-union of cyclists would be organised next year, when the venue would most probably be the Albert Hall. Loud cheers greeted this statement, while the particulars given out from the chair of a gigantic "Cycling" race meeting, which it was proposed to hold next season in London (the profits to go to the National Cyclists' Union, while the proprietors would be guarantors in the event of any loss) also aroused much enthusiasm.

Three special representatives of "THE MOTOR" will leave London next week to report the Paris Show.

An illustrated description of the 10-12 h.p. Motobloc is crowded out of this issue. It will appear next week.

Mr. J. A. Jackson, the captain of the Motor Cycling Club, has just severed his connection with Bradbury and Co., Ltd., with whom he has been associated so long. Mr. Jackson has had a very large experience in the bicycle and light automobile trades, and we have no doubt that we shall soon hear of him taking up another important appointment.

The annual report of the Riley Cycle Co., Ltd., Coventry, shows a profit of £1,662 2s. 8d. for the year. After making provision for interest or debenture shares at 5 per cent., depreciation, directors' fees, etc., a balance remains of £410 4s. 7d. to carry forward. It is satisfactory to note that the motorcycle and tri-car department shows good and improving results.

In addition to the prejudice against which the motor omnibus has to fight, the prospects of an early revolution in favour of this up-to-date method of transit were retarded last week, a fire destroying eight of the ten buses which have been plying between Kilburn and the Marble Arch. An employe is alleged to have used an oil lamp instead of an electric light during the night in the garage at Kilburn; the lamp fell and ignited some petrol on one of the cars, and before the Kilburn Fire Brigade could reach the spot four buses had been destroyed and four more damaged.



Encountering a flock of sheep on the road.

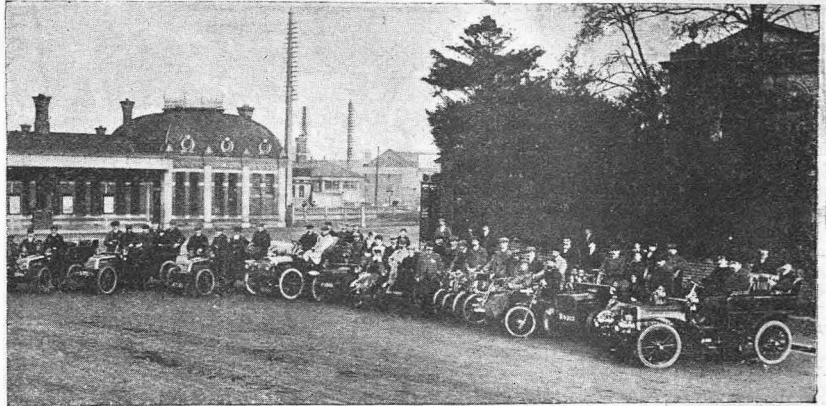
## NEWS.

### A Remarkable Fire Engine.

The most remarkable fire engine yet built has just been delivered by Messrs. Merryweather and Sons for the Finchley Urban District Council. It comprises, in one machine, a chemical engine, a powerful fire pump, a fire escape, and a hose tender. The carriage is made of steel, with wrought iron axles and artillery wheels, with solid rubber tyres. It has a four-cylinder petrol engine of 30 h.p. A handsome brass hose reel is placed in the centre of the machine with 150 feet of hose, and this is connected with the chemical cylinder so that the jet can be discharged with all or any part of the hose still on the reel. The escape is Merryweather's patent "sliding carriage" pattern, with steel trussed ladders. It can be detached and attached in a few seconds, and reaches a height of 50 feet. A series of trials recently held at Finchley gave every satisfaction.

### The Collier Tyre House-warming.

On Wednesday last the directors of the Collier Tyre Co., Ltd., invited a number of people well known in motoring circles to view and lunch at the new premises at 127-130 Long Acre, London, into the occupation of which the company has just entered. The building is quite new, a shop entrance and a small showroom on the ground floor giving access to the extremely spacious upper floors. It was on the first floor that a portion of the space was devoted to the luncheon at which over a hundred sat down under the chairmanship of Mr. J. J. Purdie. A large store-place for tyres, rims, and accessories was evidently available, and there was evidence that every possible convenience had been provided for the transaction of a large volume of business. The loyal toast was followed by a toast to "The Motor Industry," given by Mr. F. Manville, Mr. Sidney Straker, the president of the Society of Motor Manufacturers, replying in a capital speech. Mr. Staplee Firth was extremely witty in proposing



On Sunday week last the Motor Cycling Club ran down to Slough in company with a number of Stanley Show friends (see page 475). The illustration depicts the party at their destination.

prosperity to the Collier Tyre Company, and the replies of Messrs. Purdie, Burns, and W. G. Williams were well received. Mr. M. D. Rucker proposed the health of "The Press," and a couple of real Irish speeches followed in reply from Messrs. Mccredy and O'Reilly. The proceedings throughout were most enjoyable, and the promise of an annual repetition was warmly applauded. Mr. W. G. Williams, the general manager of the company, came in for genuine and general praise.

### The 4,000 miles Reliability Trial

The second week of the Automobile Club's 4,000 miles reliability trial of the 16-30 h.p. Martini car entered by Capt. H. H. P. Deasy was completed on Saturday, when the total distance covered was 2,300 miles. The test was an exceptionally severe one during the past week owing to the roads being covered with snow and to the intensity of the cold, which made the task of driving (shared by Capt. Deasy and Mr. E. G. Williams) not only difficult, but perilous. Especially was this the case on Wednesday and Thursday. On Wednesday Capt. Deasy had to drive on the North Road

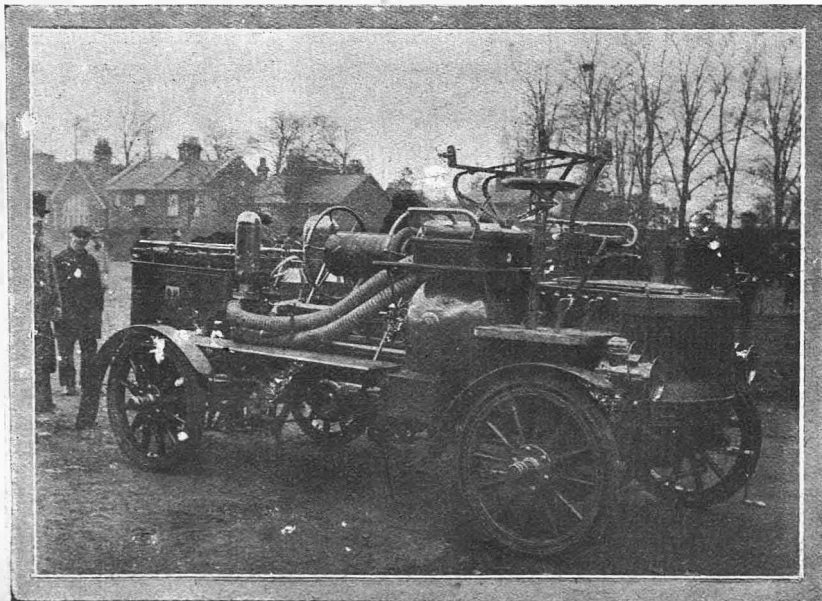
for three hours in a blinding snowstorm, whilst on Thursday, over snow-covered roads, Mr. Williams had to make the ascent and descent of Sunrising Hill, between Banbury and Stratford-on-Avon. The cold was so intense that the lubricating oil froze and had to be continually thawed. Despite all these difficulties the car ran with regularity and with no involuntary stops, though naturally the speed was not kept up to the legal limit. The official observers on the part of the Automobile Club were Messrs. Basil Joy and Spong.

### The Southern Motor Club.

Any gentleman joining the above club between now and March 31st, 1905, will be entitled to all the privileges of membership till the end of 1905. Entry forms and all particulars can be obtained on application to the hon. sec., Mr. W. L. Larkin, 223, South Lambeth Road, S.W. The club has arranged to meet at the George Hotel at Morden, Surrey, on fine Sunday mornings throughout the winter season. A notice-board will be kept at the hotel, informing members of any destination decided on. The annual dinner and distribution of prizes will take place at the Trocadero, Piccadilly, on December 1st. Ladies are especially invited.

### The Latest 10 h.p. Enfield Car.

This model, made by the Enfield Auto-car Co., Ltd., Redditch, contains many good and up-to-date features, including a two-seated body so made that either a detachable tonneau or van can be fitted. The pump has been discarded in favour of the thermo-siphon system or natural circulation of water. The dash is made out of cold rolled steel, and is so shaped that the coil, accumulator, and oiler are enclosed; and two small cabinets are fitted on each side to carry tools, etc. The engine, gear box and differential are made throughout at Redditch. The frame is of pressed steel, and the engine is the Royal Enfield latest type. All gearing is enclosed in a case running in oil. The bore and stroke are 4in. by 5in. The fly-wheel runs on ball thrust bearings. A normal speed of 1,000 r.p.m. can be accelerated up to 1,200 r.p.m. Interchangeable m.o. valves are fitted, and the carburetter is fitted on the engine. The car is hand governed from a steering pillar; and lubrication is effected by drip feed on the dash. The price, with two-seated body, comes out at 200 guineas.



The New Merryweather Motor Fire Engine referred to on this page.

## NEWS.

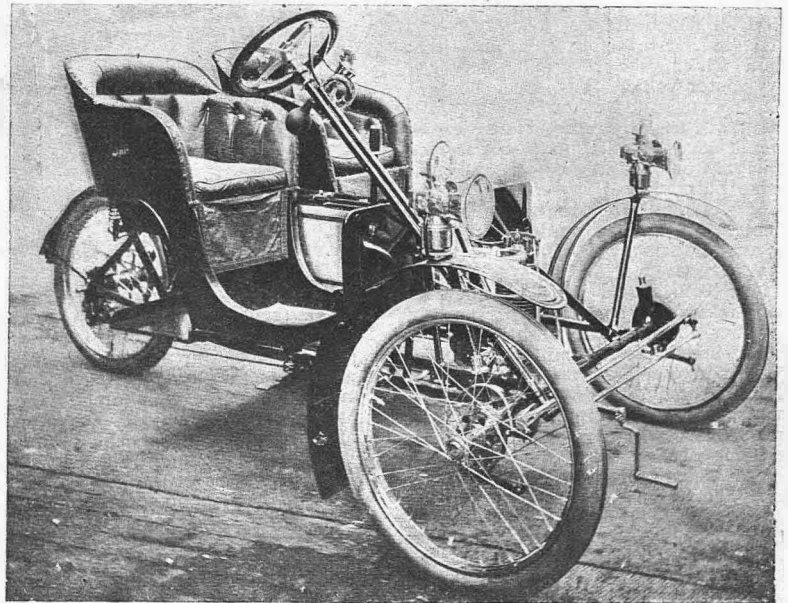
**The Dinner of the Society of Motor Manufacturers and Traders.**

On Tuesday last, the Society of Motor Manufacturers and Traders met for their second annual banquet under the chairmanship of Mr. Sidney Straker, A.M.I.C.E., the new president of the Society. The venue was the Victoria Hall at the Hotel Cecil, London, and there was a distinguished company to the number of about 140. Amongst those present were Col. Holden (chairman, Automobile Club), Sir John Thornycroft, Sir Charles Ross, Bart., the Hon. John Scott Montagu, M.P., Major J. E. Jamieson, M.P., Mr. W. J. Bull, M.P., Mr. Henry Norman, M.P., Mr. R. J. Lake, and Mr. Kenric B. Murray, of the London Chamber of Commerce, Dr. Barton, of air-ship fame, Mr. H. du Cros, Senr., and his three sons, Harvey, George, and William, Mr. Fredk. R. Simms, Mr. J. J. H. Sturmev, Mr. E. J. Mitchell, the Hon. C. S. Rolls, Mr. A. W. Gamage, Mr. E. M. C. Instone, and Mr. Herbert Austin. Following upon the usual loyal toasts, in which reference was made to the part which has been played by his Majesty in connection with motoring, Mr. Montagu rose, and in a witty and thoughtful speech proposed prosperity to the motor industry. He argued that the British car of to-day was equal to if not

BETTER THAN ANY CAR PRODUCED ABROAD, because the details were better thought out, the materials were better, and manufacturing methods were superior. This state of affairs was undoubtedly the outcome of the pressure brought about by foreign competition. If free imports of foreign cars had not been allowed, British cars would not now be so good as they are. In a good-humoured way the "protectionists" among the audience dissented, whilst the free-traders supported Mr. Montagu, and a laughing remark from him elicited a facetious request for a vote on the subject. Mr. Montagu admitted that it was an open question, but conscientiously believed that the modern British car was an adequate equivalent to any foreign car of the same price. Makers in this country had devoted their efforts towards weight pruning, and he contended that they had gone far enough in that direction. He therefore urged them to consider how ease of transmission could be effected, and asked why the two-cycle motor was not developed and why greater compression was not attempted. He asserted that no new feature had been introduced for two or three years, and he considered that this fact was worthy of the attention of thoughtful minds. One remark of Mr. Montagu's was extremely impressive. He asked the members of the trade present if they realised that in 20 years' time everything that now moves on the road by animal power will be propelled by mechanical power, and he asserted that the price in store for the industry was an ultimate capital value of 2,000 millions sterling. He spoke of the opposition that must be expected when, in two years' time, the new Motor Bill was introduced, and urged the need for spreading the light of the new movement. In coupling with the toast the name of Mr.

Harvey du Cros he said of the pneumatic tyre that it is not so perfect as it might be, but the difficulty of running a soft material over rough and flinty roads was no light one. The toast was well received, and Mr. du Cros, on rising, was heartily applauded. He said that the work of the Society had been well carried out, and it was one of those matters which made those who were not Englishmen admire in those who were their wonderful capacity for devoting valuable time to general and public affairs. He described the Society as consisting of 138 firms, all working for no selfish end but for the general welfare of the industry. He asserted that the motor industry was becoming a great English industry. If it is to continue to prosper, it must be looked after by the blood and iron of the trade itself. He thought that the industry should gain possession of as much of the world's markets as it could obtain. It was entitled to its share and that share was

services rendered to the Society by Mr. F. R. Simms, its first president, presented him with an illuminated address and a silver cigar box adorned with some interesting and historical enamel work. Mr. Simms, in acknowledging the gifts, said that all that had been done had been undertaken with a glad heart, and in the interest of the Society. Mr. Austin gave the toast of "The Press," which elicited a most humorous reply from Mr. J. E. Vincent, of "The Times," and a more serious one from Mr. Staner. Mr. W. J. Bull, M.P., in toasting the Society, dealt with the questions of the highways and the tramways (declaring the latter to be cumbersome and inefficient as compared with motor busses), and with the forthcoming Show. Mr. Sidney Straker, in replying, said that the chief problem about the Show was whether it should be held annually or whether there should be one in February and one in November to precede the Paris Show. The gathering



**The New 4½ h.p. (air-cooled) J. A. P. Sociable Tri-car which attracted so much attention at the Stanley Show.**

the lion's share. The biggest buyers of motors are the English-speaking races of the Empire, and he looked forward to the contemplated institution of a preferential scheme which would knit the various sections of the Empire closely together. He even indicated that he looked forward to the establishment, by the great makers of the world, of their factories on British soil. Mr. du Cros concluded with an assurance to the Society that it could count upon his support.

Mr. E. M. C. Instone proposed the health of the visitors in felicitous terms and acknowledged the good services that they and those they represented had rendered to automobilism. He made the interesting announcement that H.R.H. the Prince of Wales had promised to give his patronage to the forthcoming Show at Olympia, an announcement that was received with great applause. The toast was humorously acknowledged by Major J. E. Jamieson, M.P. The Chairman then, in a happy speech in which full acknowledgment was made of the splendid

at the Hotel Cecil was a great credit to the Society, and it augurs well for the popularity and strength of that organisation.

**A New Motor Ambulance.**

Sir W. Taylor, of the Army Medical Service, inspected one of the new Ivel armoured ambulance motors at Millbank last week. The new vehicle is manufactured by the Ivel Company, of Biggleswade, and is very similar to the well-known Ivel agricultural motor, with the addition of ½ in. bullet-proof steel shields (made by Cammell, Laird, and Co.). These shields can be folded back when the wagon is travelling. When at rest the shields are opened-out, so that in the event of any malicious or misdirected fire the occupants are protected. The tests showed that the shields were perfectly bullet-proof, even at close range. Owing to its special construction the wagon can move freely over rough ground, and should prove very valuable in war.



NEWS.

SEVERAL CHEAP MINERVA CARS.

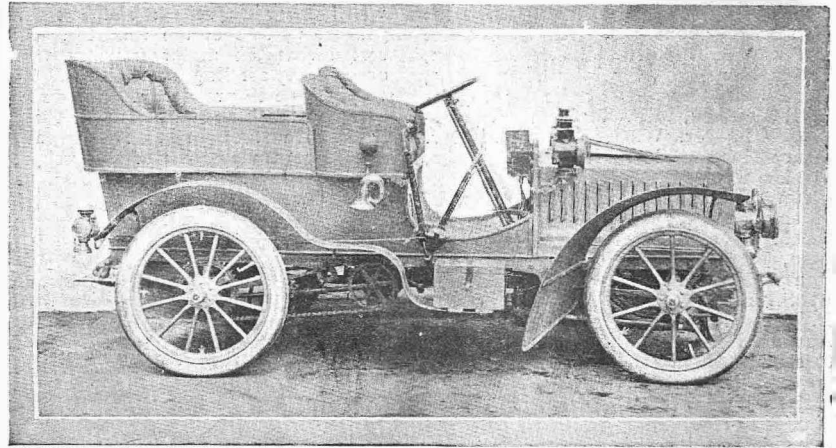
According to the "Hamburger Nachrichten," Siegfried Marcus, one of the inventors of the benzine motor, was no Hamburger, but first saw the light at Malchin in Mecklenburg-Schwerin in 1831. Siegfried was 14 years old when he came to Hamburg as a locksmith's apprentice, and subsequently went to Berlin, thence to Vienna. It appears that his age was under 20 when he settled in the Austrian capital, where he died in 1898. Marcus, senior, by the way, was a member of the Jewish Board at Malchin.

Next Agricultural Hall Motor Show.

The success of Cordingley's International Automobile Exhibition, which will be held at the Agricultural Hall, London, from March 18-25th next, is already assured. It will be under the patronage of the Automobile Mutual Protection Association, of which the Earl of Shrewsbury is president. All the spaces to let in that section which was reserved solely for heavy motor vehicles have been booked. This department, we are officially informed, will be fully representative of the modern developments in vehicles for municipal work, public services, and commercial purposes. Arrangements for an overflow display are being made by the promoters of the Exhibition. In light cars, too, bookings are still being taken up for the Great Hall, and many new types of British and foreign vehicles—which makers will be unable to get ready for earlier shows—will be exhibited for the first time at the Agricultural Hall display. As in previous years, the galleries will be devoted to accessories and components, while the Berners Hall and North Annexe will also be utilised. An interesting display of airships, balloons, etc., is being arranged by the Aero Club.

Messrs. C. S. Rolls and Co., of 28, Brook Street, Bond Street, W., have just concluded arrangements for the sole British selling rights for the cars sold under the title of "Minerva" and manufactured by the Belgian firm responsible for the similarly-named motor-cycles. The cars will be offered at very reasonable figures, the 8 h.p. single-cylinder, 115mm. bore and 130 mm. stroke, being offered at £153 for a two-seated car

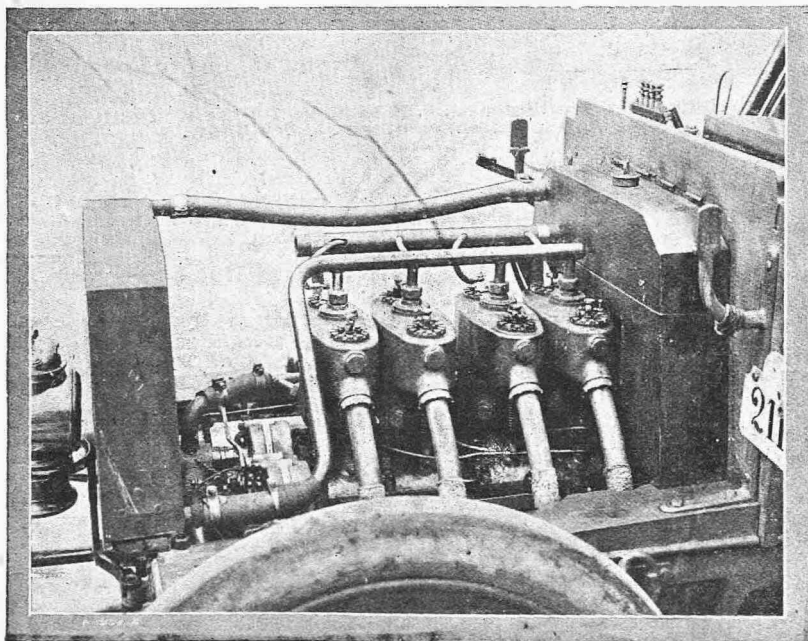
frames, three speeds and reverse, with direct drive on top speed, transmission by side chains, cooling system of centrifugal pump and gilled tube radiators, high tension ignition, three double-acting brakes, etc. Many special features claim attention, however, which distinguish these productions from many of their competitors. Taking the cheapest car for consideration first: the pump is chain-driven and the chain can be tightened by an eccentric; a



The new 14 h.p. Minerva Car.

and £178 for four-seated tonneau; the 10 h.p. two-cylinder, each 90 mm. bore by 115 mm. stroke, at £185 for two seats and £210 for four seats, and, most remarkable of the series, a 14 h.p. car, four cylinders each 90 mm. bore by 115 mm. stroke, and vending at £285, with a leather upholstered tonneau body. The general construction of the cars follows the latest designs of the best Continental workshops in having armoured wood

really capacious tank is fitted for the petrol, which will take five gallons, and the engine has a centrifugal governor controlling the throttle, this last being a very commendable point. What particularly appeals to us is the arrangement of the starting handle; when this is put into engagement with the engine, the compression is released, the air supply to carburetter regulated for the slowest speed, and the ignition automatically retarded; consequently, all fear of a back-fire is removed. Upon the 10 h.p. and 14 h.p. the petrol tankage is increased to eight gallons and is carried beneath the front seat; the pump is gear-driven, whilst the tyres are proportionately increased to carry the extra weight. Upon the larger horse-powers the brakes are internal expanding for the rear wheels: the carrying springs are also lengthened, those upon the 14 h.p. being 40in. end to end. The lubrication has received special attention: sight feeds supply the engine and the countershaft bearings to which the chain wheels are affixed, and for the 14 h.p. a further refinement is the use of pressure feed from the exhaust to the oil supply. To the highest priced car only, the very latest method in regard to ignition design is adopted, as only one trembler is used in the coil, a high tension distributor, with spark gap for each cylinder, ensuring the timing being correct for each and all of the cylinders; those who have attempted to "tune up" a multi-cylinder car will appreciate this improvement and the time and annoyance it will save. To all the cars a positive sprag is fitted to the differential shaft, this connecting by a substantial wire rope to a ring hooked up handily for the driver to reach. We congratulate Messrs. C. S. Rolls and Co. upon securing the concession for a thoroughly sound and well-finished car.



The 4-cylinder engine on the 14 h.p. Minerva Car.



NEWS.

THE NEW 8 h.p. EAGLE LIGHT CAR.

A meeting of the Automobile and Cycle Engineers' Institute will be held in London on Monday next, when Sir Oliver Lodge, F.R.S., will read a paper on "Ignition as Applied to Internal Combustion Engines."

At the recent "smoker" of the Hull and District A.C., opportunity was taken to present the badges to the winners of the non-stop run to York on September 20th—the recipients being J. H. Nicholson (2½ h.p. Humber), J. F. Freeman (3¼ h.p. Rex), A. E. Hagestadt (2½ h.p. Riley), G. H. Parker (2½ h.p. De Dion), and T. C. Philipson (2 h.p. Minerva). A very pleasant evening was spent.

Man v. Motorcar.

Under the heading "A Motor Car Illusion" a writer in "To-Day" criticises the "strong-man" act which is now being performed at the Hippodrome, as reported recently in "THE MOTOR." The contributor to "To-Day," after alleging that the De Dion motors (advertised as 30 h.p.) are only of 6 h.p., and that the 16 h.p. car "proved to be an old-type vehicle of apparently 7 h.p.," goes on to point out that a performance of this sort might—assuming that the performer were not a bona-fide strong man—be "faked" by permitting the clutches to slip slightly; indeed, he suggests that, without some manipulation of this sort, an efficient car of only 6 h.p. could not fail to pull a person, even of abnormal strength, over.

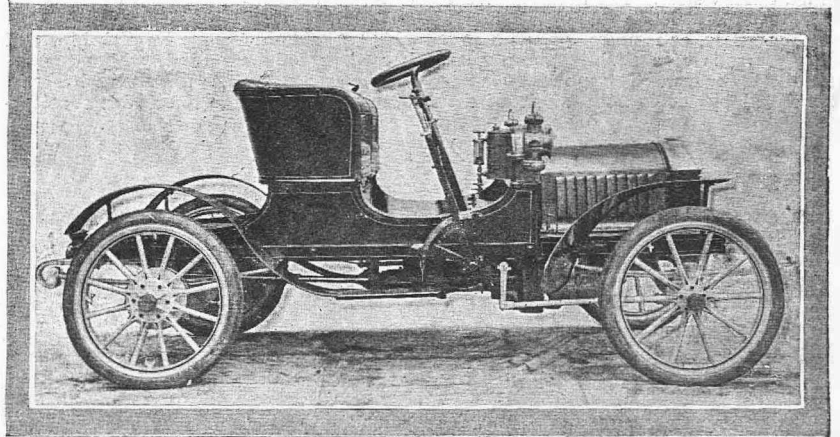
Another factor which aids the illusion is that a car when starting cannot possibly develop such high powers as when travelling at 20 or 30 miles an hour with the increased momentum due to such a velocity. The critic referred to challenged the Hippodrome artist to a test with a special 12 h.p. petrol car. The challenge was issued on November 16th, but has not yet been taken up we understand.

The Glidden Touring Car Trophy.

Next summer will see the first touring motorcar competition for the Charles J. Glidden Touring Trophy, which has been offered by Mr. Glidden, as already announced in "THE MOTOR." The conditions arranged upon provide that the competition must be held in America or Canada (or both) for three years, beginning from 1905. The distance to be driven in competition shall not be more than 1,000 miles nor less than 500 miles weekly, and shall be over regularly-used highways in the country where the holding cup is located. Each entry must be accompanied by a fee of 100 dollars, of which 50 per cent. will be refunded upon starting. In the event of failure to start the entire fee shall be forfeited to the holding club. The car shall be driven by the owner or a driver approved by the committee, the owner being a passenger in the car. All other rules governing the contest shall be fixed by a committee of seven, consisting of the president of the American Automobile Association (who shall be the chairman), the donor, and the presidents of the Automobile Clubs of America, Great Britain and Ireland, France, Germany, and the president of an Automobile Club in Canada, to be recognised by the American Automobile Association, or representatives selected by the above-named persons.

The new 8 h.p. Eagle light car, it will be observed from the illustrations which we give of it, is remarkable for several qualities. In the first place the makers have been particular to provide a long wheel base. The importance of a long wheel base is frequently overlooked by manufacturers of cheap light cars, although it is common enough in the higher powered and higher priced cars. For a small light car weighing but 8 cwt., the wheel base of 7ft. 4in. (which is that of the new Eagle production) is something rather out of the common; and this coupled with the fact that the manufacturers have distributed the weight of the vehicle in its correct proportions minimises the possibility of side-slip. Dealing further with the construction of the chassis,

attaining a very high number of revolutions per minute, albeit the running is exceedingly quiet. Regarding the exhaust valves, a neat provision is made for the adjustment of the valve striker. The cams on the half-time shaft operate a long vertical striker, which in its turn raises one end of a horizontal steel rod, and this latter being fixed in the middle, opens the exhaust valve by operating downwards. Two flat springs release the horizontal striker as soon as the valve commences to close. There should be about 3-64ths of an inch space between the long vertical striker and the horizontal valve opener, and should any adjustment be found necessary this can be made in the threaded portion of the vertical striker where a lock nut is provided. The igni-



The Eagle Light Two-cylinder Car.

which, by the way, is of wood, armoured with steel flich plates, we may say that the length over all of the car is 10ft. 11in., its wheel track 3ft. 6in., and the width over all 4ft.

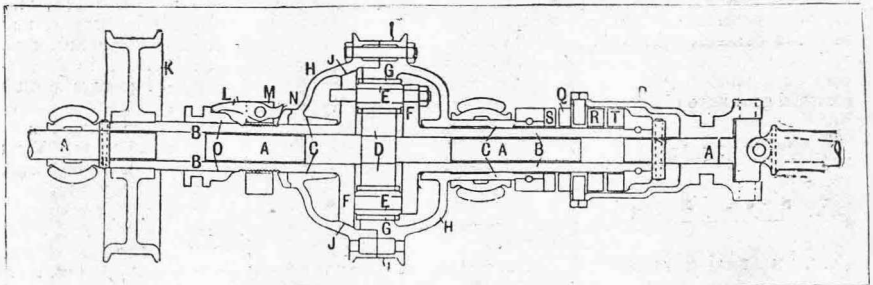
The engine is

A DOUBLE CYLINDER BUCHET,

described by the maker as of 8½ h.p. The Buchet engine, as is very well known, is an excellent motor, the bore and stroke in the present case being 85 by 90 mm. respectively. It is governed on the inlet, and is capable, like all the Buchet engines, of

tion is effected by means of positive make and break system with non-trembler coil, the coil adopted being the well-tried Bassee-Michel.

For the cooling of this car the makers have reverted to the old system of natural circulation, which they claim, when scientifically employed, is quite as efficient as pump-driven circulation and, of course, infinitely more simple. The radiator is composed of 27 tubes, with very large gills, an immense cooling surface being thus presented. The amount of water held is about 3½ gallons.



Longitudinal Section of the Eagle driving gear.

AAAA, main driving shaft; BBB, hollow secondary shaft; CC, sleeve free on BBB; D, central gear wheel of epicycloid; EE, epicycloid gear pinions; F, flange on C carrying studs for EE; GG, internal teeth of epicycloid gear cut in the gear box; HH, epicycloid gear box; II, brake drum along HH; JJ, conical friction clutch; KK, brake drum fixed to B; LL, cam lever actuating the friction clutch; MM, ring carrying the lever I; N, angular face upon which L acts; O, sliding collar actuating lever L; P, jaw clutch sliding upon A; Q and R, S and T, toothed faces of the jaw clutch.

## NEWS.

The bonnet is made of planished steel, the louvres being carried out in the same material; this gives

### A VERY SMART APPEARANCE

to the car, contrasting as it does admirably with the aluminium top of the cooler and of the plain black radiator. The petrol tank forms a portion of the dashboard, as in all the Eagle cars, and holds about nine gallons of petrol.

The transmission mechanism is the Eagle patent change speed gear. Briefly, it may be described as being of the epicyclic type, giving two speeds forward and one reverse, with the gears always in mesh; the intermediate pinions (of which there are four in number) are made of phosphor-bronze, the central shaft being made of high quality steel. The reduction from the top speed, which is direct, is 1 to  $2\frac{1}{2}$ , and the reverse, as is customary with epicyclic gears, is of a slightly higher gear than the lower one. The top speed is accomplished by locking the whole of the

The lubrication is effected by means of a hand force pump with three-way tap, and the oil tank holds over two quarts of oil.

It is claimed that, by a special arrangement of springs, the new Eagle light car is enabled to give the maximum of comfort and the minimum of vibration to its passengers. The springs are of the flat-elliptical variety, and make the suspension of the chassis extremely easy. The wheels are best English ash, and strongly made. The front wheels will be found to contain two rows of ball bearings, on the three-point system. The back axle is also fitted with ball bearings. Best English balls are used throughout. The tyres fitted are Michelin, the dimensions being 750 by 65 millimetres. This section with the long wheel base reduces the tendency to side-slip to a minimum.

Two independent bucket seats are fitted, the distance from the cushion to the top of the seat being about 10 in., or just sufficiently high to make the seat a comfortable "arm-chair." Best English hide and horse-hair only are used, whilst the arrangements of springs to suit the backs of both passenger and driver adds consider-

The attendance at the Stanley Show was exceptionally and consistently good all through the week, and good business was generally reported.

The Austrian Motor Cycle Association will hold a touring run over 300 kilometres for motorcycles next season; also a novelty in the shape of a contest in which the greatest and slowest pace of one and the same machine is to be ascertained. In this contest competitors will race over one kilometre, and crawl over 100 metres. Further, an anti-skidding competition is contemplated.

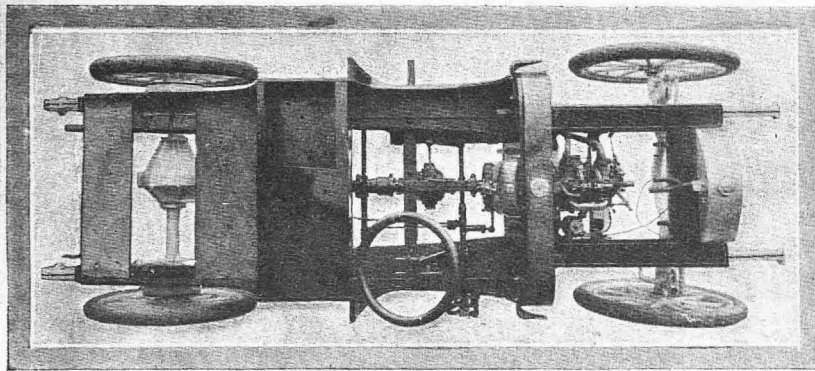
Messrs. White and Poppe write us to the effect that our description of their engines appearing on page 393 of our issue of November 15th was somewhat misleading, and might be taken to imply that they were discarding detachable valves on their air-cooled engines. This, of course, is not the case, our reference applying to water-cooled types. We regret that a printer's error crept into the same paragraph, the bore and stroke of one of the firm's engines being given as 88 mm. by 85 mm. instead of 80 mm. by 85 mm.

### Motorcars in Cheshire.

One of the subjects under discussion at the monthly meeting of the Cheshire County Council just held was the speed of motorcars. A Councillor mentioned that 893 motor-driving licenses had been issued, and expressed the opinion that the conditions under which licenses were granted were not sufficiently stringent. After a discussion on the iniquity of motorists in general, the same Councillor moved that the Roads Committee should be instructed to consider the question of fixing a speed limit. However, the Chairman explained, much to the disgust of the aforementioned individual, that the Local Government Board was the sole authority in the matter, and that no limit could be imposed without the sanction of the Board. After some more rabid speeches on the subject the matter was dropped.

### "A Weak Defence."

W. H. Norman writes as follows:—I notice with approval your strictures upon the weak defence advanced by Mr. Staplee Firth in a recent case. The defendant in that case had exactly carried out the suggestions appearing in the Press ("Daily Mail") of, presumably, the same Mr. Staplee Firth for evading the spirit, if not the letter, of the Motor Car Act—namely, that if the motorist chose to ignore the up-raised hand of a police constable and bolt, there was nothing to compel the owner of the car, identified by number, to disclose who, as driver, was responsible for its vagaries! In your article you say that this is the first case in which you remember Mr. Staplee Firth to have failed. In point of fact, I very much doubt if you are right. You must recollect that in this human world it is our successes—not our failures—that we proclaim from the housetops. I may add that I am no rabid anti-motorist. I have enjoyed many a pleasant ride on public and private cars. But, living, as I do, on the same side of London as three Gordon-Bennett race-drivers, and close to several motor factories on a main line of thoroughfare, I am certain that the percentage amongst motorists of reckless and Hooligan "road-hogs" is far greater than you and other motor journals care to acknowledge.



Plan of the chassis of the new Eagle car.

transmission system together with a metal to metal clutch, there being an adjustment provided by a threaded portion of the outer sleeve, in the event of the metal to metal clutch slipping, by which it can be tightened up. The car is driven finally by the usual propeller shaft and bevel wheels to a live axle, the ratio between the driving and the driven bevel gears being 1 to 4, the thrust being taken up by a special type of roller, and there are three rows of ball bearings at each end of the live axle. The steering is of the irreversible worm and sector type, and the control, which is in accordance with the usually accepted practice, has one noticeable feature, namely, the two forward gears are obtained from one lever, but the reverse is purposely made to come off another lever. A strong brake acting on the differential is operated through a pedal, and a hand brake is also provided, being actuated by means of the compensating motion on the two rear wheels.

ALL THE BRAKES ARE OF THE INTERNAL EXPANDING TYPE.

The control levers are three in number, two being placed on the steering pillar, and one on the dashboard; the latter regulates the carburetter, and the other two control the ignition and the governor respectively.

ably to the comfort. Two cupboards will be found underneath the seats, and are most useful for carrying tools and spares. The colour of painting and upholstery is always left to the customer's choice. The new Eagle car is, without doubt, an excellent all-round vehicle, and is certainly cheap at £225.

### South Wales and Monmouthshire A.C.

The new headquarters and motor house of the above club are now finished, and are open for the use of members at any time, day and night, including Sundays. The new buildings comprise a large motor house for the storage of 40 cars, a club room, ladies' rooms, secretary's office, and caretaker's rooms. The situation is close to Custom House Bridge, West Wharf, Cardiff, within four minutes' walk of the Great Western Railway Station—a very central position, both for town and country members. The committee has decided to grant free use of the club rooms and motor house to motor Volunteers when on military duty, and to members of other provincial automobile clubs who can reciprocate. It is gratifying to learn that the club has grown considerably in strength of late and now includes amongst its members practically every motorist in South Wales and Monmouthshire.

# NEWS.

## AMERICAN TOPIC

NEW YORK, November 12th, 1904.

The London Road Car Co. are so pleased with the behaviour of their motor buses that they purpose adding to the number of these handsome vehicles almost immediately.

Mr. Wallace Batchelor, of the Wallace Cycle and Motor Works, Kingston-on-Thames, writes to say that in the recent tri-car trials his car finished second, five minutes in front of Mr. Crundall's Humber. The motor on Mr. Batchelor's machine was a 4 h.p. White and Poppe, with a water-cooled head.

There is some talk in Berlin of building a motor track on a site bordering the Müggelsee (Müggel Lake), an expansion of the Upper Spree. Given the materialisation of the project, the track would also constitute a centre for the motor-boat sport. Not a bad idea this. The Müggelsee is a splendid piece of water from a racing point of view.

### Motor Cycling Club's Show Run.

The second birthday of the Stanley Show run, organised by the Motor Cycling Club, was celebrated on Sunday, November 20th. A fair number of motor-bicycles turned out, but the execrable condition of the roads induced many to patronise the car. Beautiful weather prevailed, and the run (which was to Slough) was greatly enjoyed. J. A. Jackson, the Club captain, presided at the luncheon, and was supported by the following prominent members of the Club: J. van Hooydonk (who toasted the visitors), Johns, E. H. Smith, S. J. Sewell, A. Candler, H. E. Cowles, W. H. Wells; while the visitors included J. Dring, H. Nisbet, J. H. Price, Vane, and W. Auning. Mr. Nisbet proposed the Club in felicitous terms, Mr. Jackson responding. Mr. J. van Hooydonk in toasting the visitors, linked together the names of Price, Bourne and Auning.

### The Indian Motor Trials.

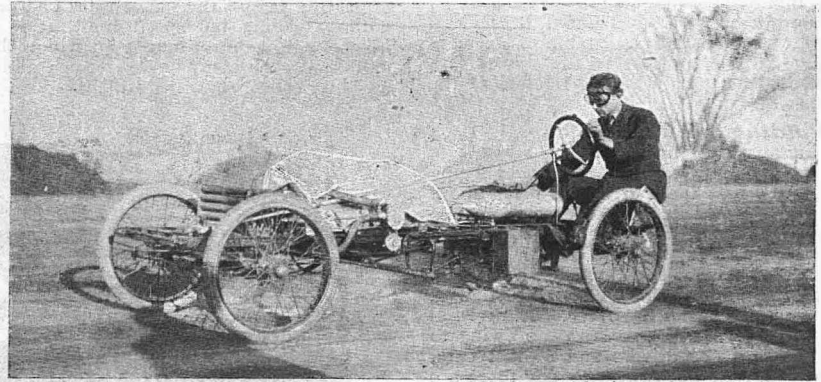
Interest in the Delhi motor durbar, as the forthcoming trials are called, continues to grow in India. Already the entries include English, French, Italian, and German cars, so that quite an international flavour has already been imparted to the event. Some apprehension was felt in the earlier stages of the preliminary arrangements that the Great Indian Peninsula Railway might decline to make suitable provision for the crossing, at various points, of the route; but any little difficulty which might have existed has now been smoothed over, and the railway has offered to assist in every way by running special trains, etc. Other railways are also making useful concessions, so that the event should be a brilliant success. It is interesting to quote from a letter recently addressed by Lord Curzon to the Motor Union of Western India. The Viceroy, in consenting to become a patron of the trials, said: "With the flat and splendid roads that India possesses, with the considerable distances that require to be traversed, with the many purposes that are capable of being served by motorcars, and with a native population endowed with so much mechanical ingenuity, there can be little doubt that a great future lies before this means of locomotion."

### A Skeleton Racer.

In a card that looked almost featureless at the start, 3,000 spectators at the Empire City Track, last Tuesday, witnessed two interesting feats of automobile record-breaking that were remarkable in their way. They saw, first, a little American skeleton machine of only 875lb. defeat two great foreign-built racing cars that had been brought to this country to compete in the Vanderbilt Cup contest and, a little later, they saw Frank Croker, son of Richard Croker, drive another American car 12 miles in 11min. 32½sec., beating all track records for amateur drivers. The performance of the frail little Ford racer

was still more odd to see the cheap skeleton car leading the costly French machine to the line, with the equally high-priced Italian car crippled in the distance. The glory of the Ford victory was added to by a new table of light-weight records, which also cut in the middle-weight figures from two to five miles inclusive.

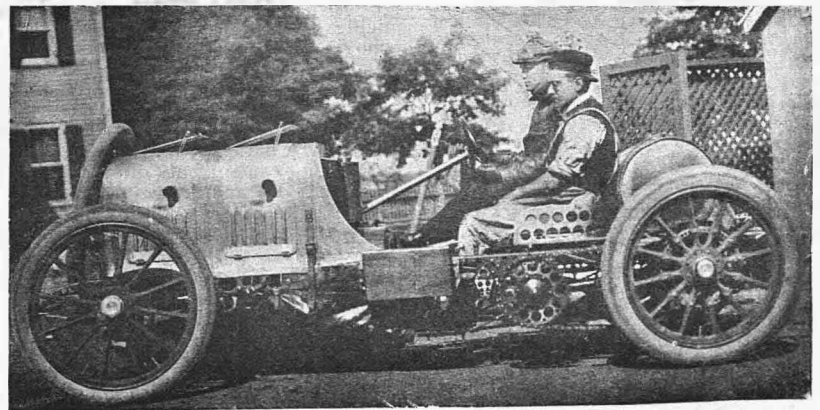
The driving of Frank Croker, and the splendid performance of the Smith and Mabley Simplex car, was one of the surprises of the day. Mr. Croker took the corners as closely and as beautifully as the more experienced professionals, while the Simplex travelled as consistently and truly as any car that appeared on the



Frank Kulick on the light skeleton racer on which he beat the cracks.

of 20 h.p. in defeating the 90 h.p. Fiat owned by Alfred Gwynne Vanderbilt, and the 60 h.p. Renault owned by W. Gould Brokaw, was the sensational event of the day. It occurred in the final heat of the international race of five miles, and furnished one of the most exciting finishes ever seen in an automobile race. The Ford, driven in faultless manner by Frank Kulick, led throughout the race, but the record-breaking Renault, with Maurice Bernin at the wheel, came like a whirlwind at the finish and failed of victory by only a fifth of a second. It was an odd sight as the trio lined up at the start, that of the American feather-weight pitted against the great French and Italian heavy-weights, each with a string of international victories to its credit. But it

track. The first mile was covered in 57½ sec., two miles in 1min. 55sec., five miles in 4 min. 48sec., 10 miles in 9 min. 38½sec., 12 miles in 11min. 32½sec. Mr. Croker intended driving 20 miles, but at 12½ miles the forward right tyre collapsed and the record test was ended. He cut the amateur track figures at every mile, the old records being held by F. Garbett, in California. Arrangements for the third annual international automobile tournament, on the famous Ormand-Dayton Beach course, are now being rapidly completed. Drivers from all over this country, and from Europe, have signified their intention of taking part in the event. The famous beach is in prime condition, and the record of 39 seconds for the mile, made on the coast



Frank Croker on his 75 h.p. Simplex.

## NEWS.

by W. K. Vanderbilt, Jun., last winter, will in all probability be beaten before the tournament is over. It is thought by experts that figures as low as 35 seconds may be made. The principal races will be the 100 miles for the Vanderbilt trophy, presented by W. K. Vanderbilt, Jun. Almost equal in importance will be the mile international records for the Sir Thomas R. Dewar trophy. The 50 miles, open to American cars only, will also provide a great race. Another important event will be the 10 miles American Derby, which will be a sweepstake race, and the only strictly professional race or cash race in the programme. There will be four days of racing, and two days of record-breaking. Sir Thomas R. Dewar, M.P., who has a large stable of automobiles, will be present at the tournament and will act as one of the referees of the races.

### Dividing the Classes.

Favourable comment has been heard on all sides regarding the steps now being taken by prominent drivers to bring about a division line between the amateur and professional drivers. There are many who would to-day drive their cars in automobile track races providing such a division were made, but who will not do so with the present rules in force. A division was impossible not so long ago owing to the scarcity of drivers and of fast cars, but that time has gone. To-day there are scores of fast cars, and scores of drivers who see no more danger in track racing than in road racing, and who want to go fast, which they can do in races.

### Records Again.

Barney Oldfield has been at it again, and his mighty machine is carrying a new load of freshly-garnered records. At Denver, last week, he broke the automobile record for 20 miles, making the distance in 18min. 45 $\frac{1}{2}$ sec. The previous record was 19min. 4sec. Twelve world's records in all were broken by Oldfield, those for two and three miles, and those from 11 to 20 miles inclusive. In another race for 10 miles he captured every automobile record from one to eight miles. In the fourth mile he set a new mark for the mile, making it in 52 $\frac{1}{2}$ sec., breaking the record of 52 $\frac{1}{2}$ sec. held by Earl Kiser. New records for the seven miles follow:—One mile, 53 $\frac{1}{2}$ sec.; two miles, 1min. 40sec.; three miles, 2min. 4tsec.; four miles, 3min. 33 $\frac{1}{2}$ sec.; five miles, 4min. 30sec.; six miles, 5min. 25 $\frac{1}{2}$ sec.; seven miles, 6min. 18 $\frac{1}{2}$ sec.; eight miles, 7min. 13 $\frac{1}{2}$ sec. His machine broke down after the eighth mile. The meet having been sanctioned by the Automobile Club of America, the records are official.

The Austrian Motor Cycle Association has an extraordinary piece of success to announce: Archduke Franz Ferdinand, heir to the Austrian throne, consents to be enrolled on the list of honorary members. This latest accession brings the number of archducal members to six, so that the association is not lacking in Royal patronage. Next year the association will hold a 300 kilometres' touring run for motorcycles, and also speed and slow races.

Mr. Shrapnell Smith, secretary of the Automobile Mutual Protection Association, will give evidence to the commission which is to enquire into the industrial value of duty-free alcohol. Mr. Smith's evidence should prove of great value.

Messrs. Peto and Radford, Ltd., inform us that they have purchased the business of Messrs. Sunderland and Marcuson, makers of the well-known Umpire accumulators. They intend to carry on the business at 61, Chandos Street, Strand, where a stock of their electric ignition accessories will be kept, as a convenience to the trade in the West End and vicinity. They will be prepared to recharge accumulators at this address.

### An Accident and its Sequel.

In these days when motorists are a much persecuted set, and are frequently appearing before the magistrates charged with exceeding the speed limit, it is a diversion to read of a case in which the motorist is the complainant. Such a one has just been before the Bingham magis-

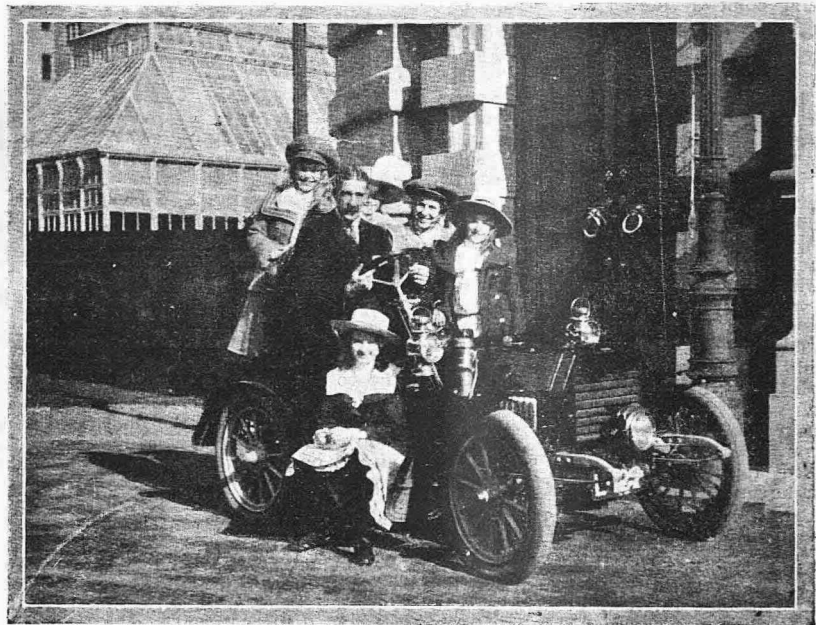
The daily Press report that a French engineer has invented a motor which will propel ships at the rate of 500 knots! What next?

A. Murkett has won the motorcycle road race from Pretoria to Johannesburg, reducing the record by 16 minutes. His mount was a 2 $\frac{1}{2}$  h.p. Vindec Special, fitted with Palmer motorcycle tyres.

### The 4,000 Miles Reliability Run.

#### THE FIRST WEEK'S RUN.

The result of the first week's run of Capt. Deasy's 16 h.p. Martini car in the 4,000 miles' A.C. reliability trial, has been most satisfactory. Eleven hundred miles have been covered—five daily runs of 200, and the initial 100 miles to Brighton and back. Only one involuntary stop has been recorded: this was due to the breaking of two chain bolts. A bad side-slip on one of the greasy London streets strained one of the wheels so much on one occasion that a new one had to be fitted before starting on the following day: this was done in half an hour.



A FULL LOAD.

trates, and it will serve to show how cautious drivers of other vehicles should be when travelling along the road at night. It appears that Frederick Ellis, who is employed by the Notts. County Council as a motor-driver, was in charge of a car on the Fosse Road at Car Colston one evening recently, and drew aside to re-light his back lamp. While he was doing so, Charles Thurman, a carrier of Screveton, came along driving a horse and cart. He apparently took no notice of the light, and ran into and damaged the car. The motorist at once went after the offender, and had some trouble in ascertaining his name. When this was done two policemen visited his house, and found that defendant had been worshipping freely at the shrine of Bacchus. This, no doubt, accounted for the mishap. The Bench contended that motorists, as well as other users of the road, had a right to be protected, and they imposed a fine of 20s. and costs.

### Light Car Efficiency.

Our illustration represents the 6 h.p. Siddeley light car, on which Mr. Arthur Cayley, of Salesbury (near Blackburn), recently completed a tour to Northumberland and back. The tour commenced with a non-stop run of 92 miles from Blackburn to Northallerton, and after one hour for breakfast did another non-stop of 65 miles to Morpeth. After lunch and a refill of petrol, the car ran through to a shooting lodge on top of the Cheviot mountains, a further 35 miles, part of this being over bad roads, with numerous fords and very steep hills. The whole distance of 192 miles, inclusive of the two stops of one hour each, was accomplished in 12 $\frac{1}{2}$  hours, and the load consisted of Mr. Cayley and his brother (average weight 12 $\frac{1}{2}$  stone each), also a portmanteau, spare tyre, four tubes, two full cans of spare petrol, and numerous tools and spares. The photograph was taken at the front door of Haggerston Castle.



## NEWS.

We understand that Humbers intend building a two-cylinder Olympia tandem.

**Light Cars at a Glance.**

We have prepared a booklet with the above title, giving a description of the majority of the light cars upon the market up to £300. This was obtainable at our Stand at the Stanley Show, free of charge: we shall be pleased to post a copy to any portion of the United Kingdom, if a stamped, addressed envelope is sent with the application. Those wishing a copy should write to the *Manager*, and not to the Editor.

**Scottish A.C. Reliability Run.**

Mr. R. J. Smith, hon. sec. of the Scottish A.C. (Western Section), writes to say that the committee are contemplating a more severe trial than that which has been held for the last three years under the title of the Glasgow to London Reliability Run. A three days' trial over Scottish roads, embracing the chief cities and towns of the kingdom, as well as the mountain roads and passes, with some severe hill tests, is suggested. The Committee will be glad to receive from readers of "THE MOTOR" their views on the matter, and whether (subject, of course, to approval of the conditions of entry which would be published later) they would be prepared to make any entries.

**Some Sound Advice.**

Motorists who have not yet joined the Motor Union will find the present is the best time to do so. The annual subscription of one guinea paid now covers membership to December, 1905. The advantages of membership are many; in fact, it is true to state that no automobilist of moderate means can afford to stand outside the ranks of the Union. Membership of the Union carries with it many personal benefits. Members are given legal advice and information free of cost, and the many applications that are made to the Union by members when they are in legal difficulties is more than sufficient evidence of how valuable this privilege is. The Automobile Handbook is sent post free to every member, and has already been described by us as one of the "spares" which every motorist should find room for on his car or machine. The automobilist on tour finds the Motor Union rendering him the same assistance as the C.T.C. does to cyclists. The Union has obtained special insurance terms for members, as well as special privileges in other directions. Apart, however, from personal advantages, every automobilist is under an obligation to join the Motor Union, as it is only through this organisation that the rights of motorists can be maintained and extended. It is mainly owing to its efforts that 10-mile limit restrictions have not been imposed on motorists in many of the boroughs and counties of this country. It vigorously opposes all the reactionary proposals of local authorities to impose unnecessary restrictions on automobilists. We therefore ask those of our readers who have not already done so, to send a guinea to the Secretary, Mr. Rees Jeffreys, 16, Down Street, Piccadilly, and ask to be added to the membership roll.

**The Motor in Klondyke.**

A correspondent (A.H.D.) sends us the following account of the introduction of the motor to the Yukon Territory:—In the winter of 1900-01 I was returning with two companions to Dawson city from an expedition up the Klondyke river, and on nearing the town was surprised by the presence of a very strange-looking object on the trail some distance ahead of us. We could see that it was not a sledge, being too high in build, and a wagon was an impossibility on the winter trail; furthermore, this vehicle was apparently fitted with three pairs of legs and was lurching along like a ship in distress. Closer acquaintance revealed an automo-

pathetic remarks being received in scornful silence, we left them to finish their enjoyable run by themselves, and proceeded on our way. We found afterwards that this car was one of six which an enterprising Frenchman had brought into the district over the White Pass Railway and down the frozen Yukon to Dawson, with the idea of establishing a motor service in and around that district. For a time they formed an object of interest to the residents of the city, the bravest of whom would indulge in speed trials through the broader and smoother streets. After a few weeks, however, they quietly disappeared, no one seeming to know what had become of them.



Giv'ng him a start: A recent scene in Berlin

bile, which we recognised from the accounts we had read of them, but until now had never seen. The unfortunate passengers had attempted to make a journey up the Klondyke trail, and had succeeded in getting about two miles; but, when we overtook them, were endeavouring to return. The trails or roads in this part of the world are formed in the winter by pedestrians, who, in travelling through the snow, trample it down until it becomes a hard and smooth surface, each successive snowfall building up the trail and levelling the inequalities. After the trail becomes sufficiently hardened, sledges follow, the runners of which wear two ruts in the surface, while on either side of the trail is a soft bed of undisturbed snow. Unfortunately, the vehicles had been constructed

WITHOUT REGARD TO THE GAUGE OF THE SLEDGE RUTS,

and were much too wide, with the result that two wheels were in a rut and two ploughing through two feet of loose snow beside the trail. On getting the erring wheels up on the solid surface, the other two would bury themselves in the snow on the other side, and in this plight we saw our first motor. Three of the passengers were pushing the machine along, while the driver was vainly endeavouring to coax it to keep all its wheels on the trail at once. Our encouraging and sym-

The Paris municipal authorities are considering a proposal to take over the horse-driven buses and replace them by petrol vehicles.

**Ladies' Automobile Club.**

At the last meeting of the Committee of the Ladies' Automobile Club of Great Britain and Ireland, the following ladies were elected to membership:—Lady Greenall, the Lady Margaret Compton, Mrs. Almeric Paget, the Viscountess Southwell. The Committee have arranged that Mr. R. Sedgwick Currie (consulting engineer to the L.A.C.) give a course of six lessons to members of the Club on the internal combustion engine as applied to self-propelled vehicles. The first of this instructive series of lessons was given, we understand, at the Club, on Tuesday last. Lieut. Windham, R.N., has kindly consented to deliver a lecture on some of his motoring experiences to members of the Club and their friends, on Wednesday, December 7th, at 3.30 p.m. Lieutenant Windham will illustrate his lecture—"Seven Years' Experience of the Good and Bad Points of a Motorcar"—with some 50 or 60 lantern slides. Members of the L.A.C. will be admitted to this lecture on presentation of a special admission card, for which they will be charged 2s. 6d. (for tea, etc.). Each member may bring one non-member friend. Tickets for whom will be the same price

## NEWS.

Carless, Capel, and Leonard inform us that they have reduced the price of their standard petrol 1d. per gallon.

Michelin et Cie inform us that they are removing to 49 and 50, Sussex Place, South Kensington, which they have taken as a temporary depot.

The Aster Co. has been awarded a gold medal at the St. Louis Exhibition for its exhibits of motor engines.

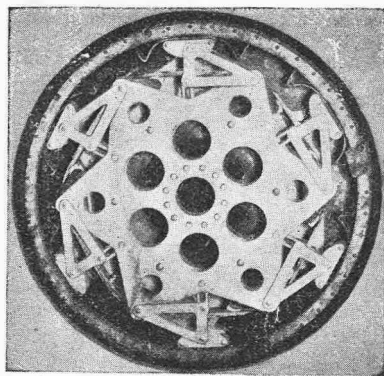
Messrs. Harvey Frost and Co., Ltd., have been successful in obtaining the services of Mr. P. L. Breysig, so well known throughout the South and East of England. This company has also secured the services of Mr. A. S. Bowley, who for many years has been closely connected with the pneumatic tyre trade. He will soon be calling upon his old friends in the interests of Messrs. Harvey, Frost and Co., whose vulcanising appliances have met with so much success in the motor and rubber manufacturing trades.

### Leicestershire A.C.'s Social Evening.

The Leicestershire A.C. had a successful social evening on Tuesday, November 19th, in the shape of a lecture and concert. A very large attendance of members and friends put in an appearance, the President of the Club (Mr. E. G. Mawbey) being in the chair. Mr. Shrapnell Smith—the energetic secretary of the Automobile Mutual Protection Society—was the lecturer, and his address on "Motorcars, Past and Present," was full of interest. The musical part of the programme consisted of operatic selections, violin solos, vocal selections, etc., etc.—this part of the entertainment gaining additional attraction from the fact that smoking was permitted. A feature of the evening was a brief speech by the Chairman, who alluded to the flourishing condition of motoring in Leicester.

### One Hundred and Five Miles an Hour.

Baras, the well-known French racing motorist, has just succeeded in breaking the record for the flying kilometre at Ostend. The speed course at this popular Belgian seaside resort is notoriously a fast one, many records having been established here by French and Belgian motorists, only to be knocked down in rapid succession. The flying kilometre has been particularly favoured this summer, Rigolly's recent figures of 21½sec. being beaten by one-fifth of a second. The light car record over the distance is held by Edmond, who (on a Darracq last July) did 32½sec.—roughly, 70 miles an hour. Three weeks ago Hemery, on a medium car of the same make established a record of 25½sec.—equal to about 80 miles in the hour; and now, 10 days ago, Baras almost literally flies over the course on a heavy Darracq in 21½sec., which works out at a round-figure average of 105 miles per hour. In addition to these three records, the standing mile and the standing kilometre hill-climbing records are also held by Darracq cars piloted by the same drivers—striking testimony to the speed powers of the cars and to the skill of the three famous drivers in handling them.



**A New Spring Wheel which is claimed to surpass the pneumatic tyre in the matter of efficiency. It was described last week on page 420.**

We are informed that a limited liability company has been registered with a capital of £30,000 to acquire and carry on the business of the Duryea Co. in the manufacture and supply of Duryea power carriages, at the works in Widdrington Road, Coventry. We understand that the new company will be under the chairmanship of Mr. Henry Sturmev.

### Austria and the Little "G.B."

At the last sitting of the Austrian Motor Cyclists' Association (Vereinigung) Herr Siercke stated that five Austrian firms had already given official intimation of their intention to enter motorcycles for the qualificative trials in connection with next year's race for the French Motor Cycle Club's cup. One of the members proposed that the association should offer a prize for the motorcycle making the least noise. The motion was referred to a committee for consideration. As in former years, members will place themselves and machines at the disposal of the military authorities during 1908 for certain manoeuvres—or, rather, for the solution of given problems. Another item on the 1908 programme is an "average speed" contest over 200 kilometres, each competitor having to state beforehand the average at which he purposes travelling, and the prize going to the rider who gets nearest to his average.

The Duryea Power Company, who exhibited cars at the St. Louis Exhibition, have been awarded a bronze medal for the all-round excellence of their cars.

As already 200 applications have been received for a space covering some 5,000 square metres, the success of the International Motor Exhibition, to be held next year at Berlin, may be regarded as assured, and the more as the German Emperor himself is to open it.

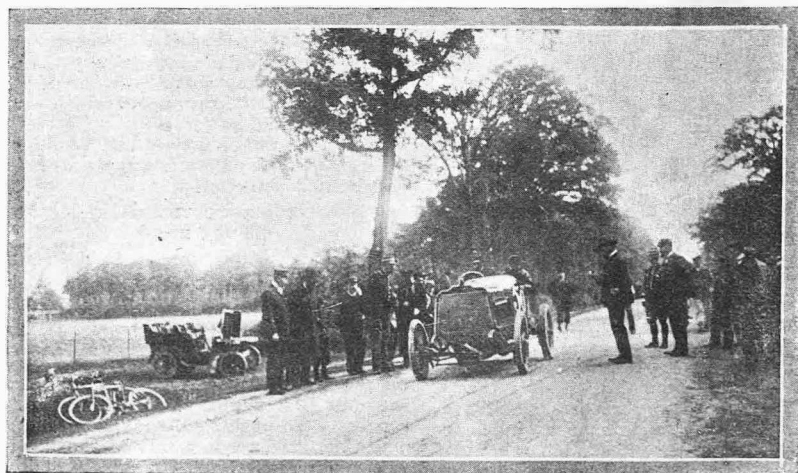
### A Berlin Motor Track Project.

The project of a motor track on the Ruhleben demesne, between Charlottenburg and Spandau, in the proximity of Berlin, is advancing towards materialisation, we understand. The land in prospect lies near a suburban railway station and the River Spree. Both the Fiscus and the present lessee are willing (the latter against compensation) to give up the site for the desired purpose. An order from "above" has caused the Infantry Shooting School to evacuate the Ruhleben redoubt in order to make room for the sporting undertaking.

### Motoring in Australia.

RAPIDLY INCREASING INTEREST IN THE PASTIME.

A road race from Sydney to Melbourne—575 miles—has been arranged for next February. Mr. Mark Foy, the well-known automobile enthusiast, has undertaken to provide a trophy to be competed for annually on much the same lines as that of the Gordon-Bennett race. The nature of the roads to be covered varies very much. Over some sections of the course the going will be excellent, whereas in other parts heavy sand and deep rutty clay will be encountered. The first part of the run, from Sydney to Goulburn, will test the climbing powers of the cars. A Sydney correspondent informs us that motoring is making a rapid advance in the country in spite of the disadvantage of bad roads. There are quite a number of cars and motorcycles in Sydney now, and several garages and motor agencies. The light car is beginning to assert itself in popular favour. Quite recently a 6 h.p. De Dion made the trip from Sydney to Melbourne in very good time; and many other similar tours over country roads prove that there is lots of room in Australia for reliable touring and business cars.



Baras starting for his record Kilometre.

# OTHER PEOPLE'S VIEWS



NOTE.—These columns are set apart for the discussion of motor topics by bona fide readers of "THE MOTOR," and trade letters containing veiled advertisements are not admitted. The Editor is not responsible for opinions expressed by correspondents in this section.

### A Car Incident.

Sir,—Whilst returning on a recent evening from a 70-mile run in my 10-12 h.p. Humber car, I filled up my lamp generator with water, using a glass jug for that purpose, and to my astonishment found on arriving home that I had carried the jug on the footboard at the side from Lockhffe (a distance of nine miles). Considering the blustering wind, pouring rain, and the very bumpy roads, this incident speaks well for the smooth running of this type of car. Yours faithfully,  
W. A. SALE.

### The "Progress" Magneto Ignition.

Sir,—In reply to "G.I.G.," the Progress Company have no agent in England. Their address is 39, Wilmersdorfstr, Charlottenburg, Germany. I do not know the cost, as I bought my bicycle complete. I should say the cost of upkeep would be at the outside ros. a year (i.e., £1 every two years for re-magnetising). Your correspondent "Hamburg" is not correct in saying that ignition by the Progress system is effected by means of a push rod from the piston. Contact is made and broken by means of an arm actuated by the two-to-one gear. In my letter of October 11th I did not intend to sing the praises of the Progress system of ignition, which has the faults inherent to low tension, but simply of their magneto, which is thoroughly reliable and, from its light weight (5 lb. 10 oz.), very suitable for motor-bicycles.—Yours faithfully,  
H. E. COLVILLE, Maj.-Gen.

### Trembler versus Non-trembler Coils.

Sir,—I regret that I am the possessor of only one coil, and so am not able to lend Mr. Macleod two coils as he suggests. The difficulty is, however, very easily overcome. If Mr. Macleod will insert a little resistance in the circuit of the coil having the lowest resistance, he can easily arrange that they take exactly the same current when it flows steadily through them. Now, suppose this is done, and that both coils are connected in the usual way with exactly similar contact breakers on the two-to-one shafts, there can be no question that equal quantities of current will flow through each coil. But, further, it must be perfectly clear that if the trembler on the trembler coil gives even one vibration, less current must pass through that coil, owing to the interruption of the circuit by the trembler. I hope Mr. Macleod will not say that it is necessary for the coils to have different contact breakers, a wipe for the trembler, and a quick break for the other, for all this year I have used a quick break with a trembler coil, and up to the present have never had a mis-fire. Yours faithfully,  
ALEX. HILL.

### Magneto Ignition.

Sir,—The magneto a correspondent enquires about can be obtained from Messrs. Coudret, 30, Beauchere Road, Shepherds Bush, London, W., where I bought one some months ago. I believe they stock magnetos for two and four-cylinder motors as well.—Yours faithfully,  
F.P.G.

### Engine Acting as a Brake.

Sir,—I should like to reply to "KI14" on "Engine acting as a brake." The substance of his note is that if the piston has a high speed, the compressed air has not time to act on it. But may I suggest that he is wrong? If there is a pressure in the cylinder then no matter how fast the piston moves on its own account, whether due to gravity or not, power will be given to it by the compressed air, which power varies as the pressure attained. The reason of the undoubted braking action is more probably as follows:—The piston rising compresses air and in so doing utilises a certain amount of energy which is stored up in the compressed air. A certain amount of this compressed air escapes through the valve seats, past piston and rings, etc., and therefore the amount of stored-up energy is diminished. So that the power available to be returned to the crank-shaft or fly-wheel by means of the pressure on the piston is less than the power utilised in compressing the air. Also, when air is compressed, heat (another form of energy) is formed and escapes through the cylinder walls. This heat is lost to the engine, so that the energy given back on the downward or expanding stroke is less than the energy given in. These losses, as well as those due to friction of moving parts, occurring some hundreds of times per minute, constitute the undoubted braking action of the engine when running without firing. The subject is an interesting one, and I hope to hear further opinions expressed.—Yours faithfully,  
F684.

### Angle of Driving Pulley.

Sir,—In your issue of the 1st inst. I see Mr. A. M. Close complains of the belt on his 3 h.p. machine wearing out quickly. I have had the same experience on a tri-car, and on submitting the pulley to Messrs. Ormerod (the Watawata belt manufacturers) to be altered by them to suit one of their belts, which I intended to try, it was found that the pulley was turned at an angle of 40 deg. instead of 28 deg., which, I believe, is the correct angle for all pulleys. Possibly this may be the reason of Mr. Close's belts wearing as they do, as I have no doubt it was in my case.—Yours faithfully,  
WM. S. CLARK.

### Twin-cylinder Light Car Engines.

Sir,—It has been a great surprise to me that makers have not adopted the twin-cylinder engine in this year's light car designs in preference to the vibrating single-cylinder. Also, why has not a more efficient method of transmission been designed? In my opinion transmission by propeller shaft and bevel gearing is very wasteful of power, and very noisy. I consider that the Wolseley transmission by central chain is the best method. That it is efficient, and transmits the greatest percentage of power to the road wheels is amply proved by its numerous successes over cars of bigger horse-power but fitted with propeller shaft drive. Why not, then, add another cylinder, and secure flexibility and silence, and dispense for ever with vibration? A short while ago I took a ride of about a hundred miles or so in a single-cylinder voiturette, and for days after, when waking up in the morning I could distinctly feel the impulses of the engine in my head. If some of our makers would design a light car, with a double-cylinder horizontal or diagonal slow-speed engine, transmission by chain to gear-box and thence by central chain to back axle, honeycomb radiator and neat bonnet, the whole to come out at about £175, I think it would almost stand alone as the ideal car. Regarding light and heavy-weight motorcycles, although I belong to the heavy brigade, I feel that I must congratulate you on turning out the best light-weight machine that I have ever seen. For a rider of about 10 stone in weight it would, I consider, be quite powerful enough. Above that weight I plump for high power. My present machine has a 3½ h.p. Stevens engine, with automatic inlet valve, which has proved most satisfactory. It will take me up any hill without pedalling, and I find that I can touch 45 miles an hour on the level. My weight is 14st. 10lb. Will readers kindly give me, in "THE MOTOR," their experiences of the Beeston Humber Olympia tandem, together with highest speed on the level, and cost of upkeep?—Yours faithfully,  
SUNNY JIM.

A  
POCKET  
ENCYCLOPEDIA

on all  
matters  
connected with  
automobilism is

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The **MOTOR MANUAL**

A New and Revised Edition  
(6th) is now ready

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O.P.U.

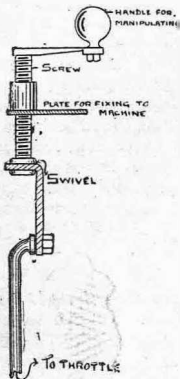
### Lady's Light Motor-bicycle Wanted.

Sir,—Is there any firm who will construct a lady's motor-bicycle on the following lines? Weight well under 100 lb.: engine 2 to 2½ h.p.: two-speed gear: free engine: plenty of clearance everywhere: wide mudguards: high-tension magneto: handle-bar control: good, solid fittings. This is my ideal of a lady's motor-bicycle, which, hitherto, I have been unable to realise. I shall be glad to hear from any enterprising maker who can produce the desired article.—Yours faithfully,

MARY E. KENNARD.

### A Regulating Device.

Sir,—As a user of the Fafnir engine, perhaps the enclosed sketch of an arrangement I have had made for operating the exhaust throttle will be of interest. You will note that it is operated by a screw, enabling a very sensitive adjustment to be obtained. I am so satisfied with the results that I am thinking of operating all the remaining taps by the same method.—Yours faithfully, A5000



Illustrating letter from A5000.

### Gudgeon Pins, Light Machines, etc.

Sir,—Re gudgeon pin troubles. The wide piston ring idea is all right, but there are not many pistons which will allow for a groove ¼ inch or more deep to take such a ring. We notice that "E138" thinks he is absolutely safe, but we could show him some set screws like his that have come out without turning, being knocked out by the pin itself—(we have sent the pin and set screw for inspection)—when it gets the least amount of room in piston walls, which is more often the case. We have had a lot of gudgeon set screws come adrift in crank chambers this last two years, and are protecting an idea that can be easily fitted to all pistons now in use, making it impossible for anything to come adrift and set up trouble in the crank chamber. "E138" must explain lack of replies as to running on two volts. to riders' laziness in writing, as we have fitted terminals to the ordinary four-volt. cells for several customers; these, by the way, are made easily from terminal cap of spark plug porcelain, which is tinned inside and just sweated over the lugs. We are rather surprised to see Mr. Wallace advising riders to use a blow-pipe flame near accumulators, which will fire from a hot iron if not used carefully. The best way is to cover the top of the accumulators with asbestos or cardboard when soldering, and saw apart to undo the bridge connection. Two years ago we made a light-weight machine (Solb.) and fitted 1½ in. Black (detachable) tyres (tandem), which (when last seen) had done about 3,000 miles and looked good for 1,000 more: the owner always uses two volts, and mostly a mixture of paraffin and petrol (half and half, to the best of our knowledge).—Yours faithfully, W. PRETTY AND CO.

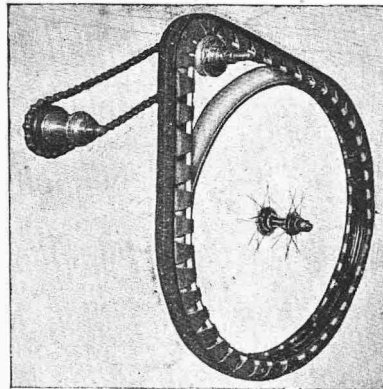
B24

### Alteration to Drive of De Dion Tricycle.

Sir,—I have a 2½ h.p. De Dion tricycle, which makes considerable noise in the gears, and I would like to convert it to either chain or belt drive. Can any of your readers suggest a method of doing this, and would it be a success? Also, does anyone sell sprockets or pulleys for this purpose? I am continually breaking the gears, and it is very expensive.—Yours faithfully, TRIKIST.

### Palmer Tyre Experiences.

Sir,—In answer to query by "Anti-Vibration" as to the suitability of Palmer tyres for springless tricycles, I can inform him that I have ridden over 8,000 miles on a tricycle fitted with Palmer 28 in. by 2 in. tyres on driving wheels, and that he need have no fear. I always ride with the tyres fairly slack, and as for chafing the inner tubes by so doing, I find that no such thing happens. I never for any cause have to touch my tyres, and I regard punctures as almost impossible: I have never yet experienced one. I ride without a spring seat pillar or any vibration-absorber other than the tyres and a very ordinary saddle. Only on the roughest of London roads do I experience any discomfort from jolting. My confidence is such in these tyres that I have completely discarded the jack.—Yours faithfully, A948.



Illustrating letter from Knight and Howorth.

### Crank-Shaft Out of Truth.

Sir,—A rather unusual trouble has developed lately in my motor. On having the bearings re-bushed I was surprised to discover that the crank (the motor is an outside fly-wheel type) would not revolve at all without forcing the two halves of the crank case apart. I found the crank was not true. On placing one of the old bushes in again, the crank revolved all right except when the cylinder was put on. This shows that the connecting rod end of the crank is quite out of truth, indeed it is visibly so. Surely it could not have been turned out so by the makers; and yet what could have put it out of truth? This only prejudices me more in favour of the inside fly-wheel type, as the reciprocating parts that balance the connecting rod came loose the other day. Surely ebonite cased accumulators are cleaner and cheaper than celluloid; yet why are they not in such great demand? I have never had a terminal covered with corrosive matter yet. Wishing your light-weight motor-bicycle every success.—Yours faithfully, T.G.

### A Novel Drive.

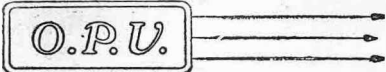
Sir,—We beg to send you a photograph of a new idea for driving motorcycles, etc., which we have protected. The special features we claim are as follow:—We have a flat non-slipping belt 3 in. to 4 in. wide driving off a large pulley 6 in. to 12 in. in diameter if necessary, which is suitably geared by chain wheels from the engine. This band encircles the tyre. The drive is central, which means much longer life to the bearings, reduces liability to side-slip when rounding corners, and the power of the engine is transmitted direct to the road. Further than this, by means of metal studs or other devices side-slip and skidding are reduced to a minimum, and last, but not least, the tyre is rendered puncture-proof and its life greatly lengthened, as it never touches the road. It can be ridden at about half the usual degree of inflation, as the pressure at point of contact is greatly extended over its surface by the belt, without affecting the resiliency of the tyre. This must necessarily reduce vibration. It is impossible for the belt to come off, owing to the two smaller belts at the sides being of less circumference than the outer. It does not take so much power to bend as the V belt (we have tested this most carefully), and a further point in favour of this method of driving is that, the driving pulley being very large in diameter and on a countershaft, it will be a very simple matter to fix a two or three-speed gear and clutch of good working size.—Yours faithfully,

E. S. KNIGHT and H. O. HOWORTH.  
Nottingham.

### The 1904 Werner.

Sir,—Having seen three letters now as to the 1904 Werner machine I should like, as an unprejudiced rider of this make since February last, to give you my experiences. First, I nearly gave the machine up in despair on account of the old carburetter fixed in the tank over the engine; it was too unmanageable, too crude, and took at least a quarter of a mile's running before it began to work properly. Since having a spray carburetter fitted I have been happy. Now, as to the expanding pulley. I have been about 2,300 miles so far, and have had no trouble with the pulley at all, having kept it properly oiled. I have known nothing of its going wrong, as stated by your other correspondents. It has entirely done away with the question of too loose or too tight a belt, or one that stretches; for I have but to twist the left handle one notch and the belt is tightened microscopically by the pulley sides being brought closer together. It also affords a free engine down hill, and is easily picked up again, by first raising the exhaust valve, and then twisting the handle, which, without any jerk, puts the engine in running at once. As to the cut-out gear your correspondent enquired about, I have done away with it long ago; as, if on, the engine would race tremendously, even when only firing one revolution in four, and the arrangements of the cut-out were such that it was continually causing misfiring. I hope my experiences of the engine pulley are not exceptional, for should your readers but enjoy, as I have done, a season without the worry of a slipping belt, they would want a similar pulley on their engines.—Yours faithfully, E20.





**Who Invented the Differential or Balance Gear?**

Sir,—I was pleased to note the letters of "A Reader," H. Dracup, and "Cotton Spinner" in the "O.P.V." columns of November 15th, as it proves the interest taken in my short article on "The differential or balance gear for small cars," which appeared in the issue of October 25th. The three correspondents named are doubtless correct in their statements as to inventions of a differential or compensating gear previous to Starley's introduction; but it is interesting to note that each gives the credit of the invention to a different individual, thus proving how difficult it would be to determine the matter. I remember a fierce controversy in some of the papers some years ago on the subject. I was also aware of the "sun and planet" motion, and what is called in Lancashire engineering and milling circles the "Jack i' th' box"; in fact, I was shown the interior of one of the latter in a mill in 1873. The fact, however, remains that in the cycle and motor trades James Starley is generally given the credit of the invention of the compensating balance gear as applied to fast road travelling vehicles. He patented it as applied to self-impelled vehicles about 1878, and nearly all the cycle firms who made double-driving tricycles fitted with the balance gear paid him and his successors annual royalties. At any rate, he first brought it to the position of a marketable commodity and a commercial article. Starley's patent double-driving balance gear was fitted successfully to thousands of tricycles, tandems, and sociables, etc., in the '80's, when tricycles were popular before the introduction of the safety bicycle. Now, the motor principles of to-day, as applied to motor-bicycles and tricycles, tri-cars, and the motorcar, were first fitted to the ordinary double-driving tricycle, and have gradually developed from this; and, this being the case, I considered myself fully justified in referring to James Starley as the inventor of the differential. I have looked up volumes of old cycling journals, dating from 1878 to 1885, and I find Starley re-

peatedly referred to as the original inventor, though it is generally admitted there were earlier forms of the idea. In a supplement given with "The Cyclist" of January 24th, 1883, containing a "Biographical sketch of the life and inventions of the late James Starley," which, I believe, was written by the then editor, Mr. H. Sturmev, I find the following significant remarks referring to his invention of the balance gear:—"Mr. Starley patented the balance gearing for self-impelled machines about this period, and this was the first machine (the D.D. tricycle) to which he applied the balance gearing and rotary motion by means of an endless chain. . . . This machine was the first effective double driver that had appeared; it is true the principle of the gearing had been to some extent in existence before he adapted it to a velocipede, but whether he knew of this it is impossible to say, though connecting circumstances induce me to believe he did not."—Yours faithfully, AUTOLYCUS.

**Carburettor Puzzle.**

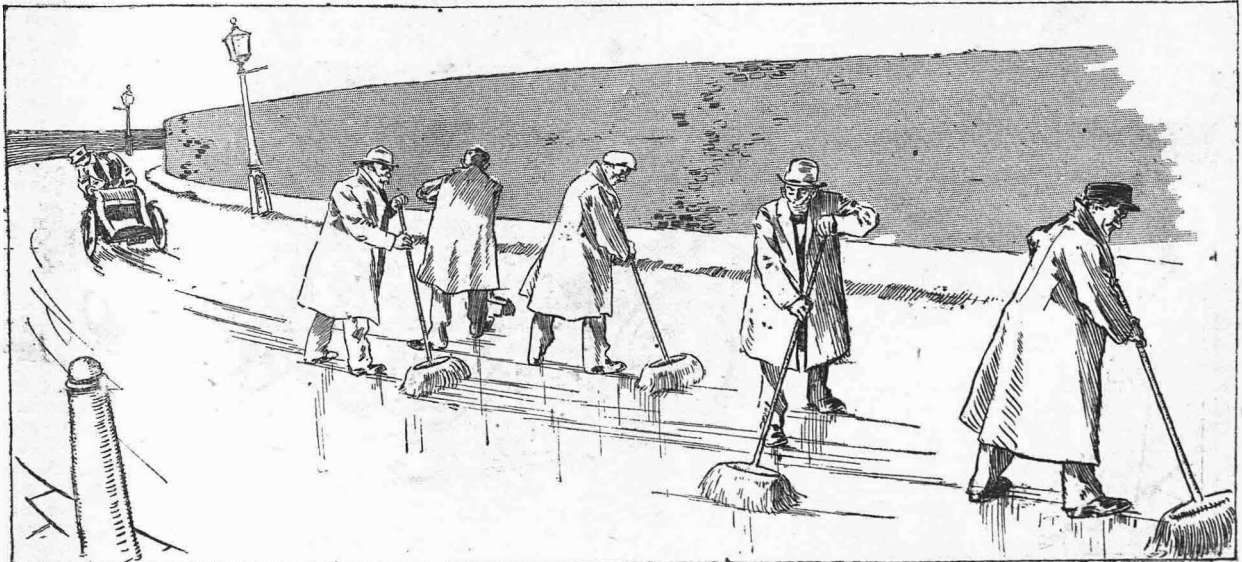
Sir,—You invite opinion in "O.P.V." in regard to the difficulty of "Puzzled" (London, N.W.). I had precisely the same experience with my Longuemare carburettor. What I found to be wrong was the puncturing of the float, with the result that the petrol got in and so made the float press on the valve spring with greater weight—hence the overflowing trouble. My remedy was to heat—cautiously, of course—the float, and thus I got rid of the troublesome fluid. All this happened on the road, and having no means of soldering the puncture which was on the underside of the float I put it in, punctured side on top, and have left it so ever since. It may happen that "Puzzled" had his float likewise punctured and that the petrol likewise vaporised by the heat of his hands or of the weather in the act of taking it out and then by accident he put in the float, punctured side up. The springs on the valves are now too strong, and the remedy is either to fit weaker springs or to make the float heavier in the way you suggest.—Yours faithfully, E.S.

**What is "Suction"?**

Sir,—Some of your correspondents seem to have an erroneous idea as to the nature of "suction." When the pressure of the gases in the cylinder exceeds that of the atmosphere, there is said to be compression. When, however, it is less than the atmospheric pressure we have what is termed suction. This is measured by the difference between the pressure of the gases inside the cylinder and that of the air outside. The pressure of the air is about 15lb. to the inch. It is manifest, therefore, that the suction cannot exceed 15lb. per square inch. In practice this value is never attained, for, as your correspondent Mr. Viner points out, the pressure in the cylinder cannot fall below about 4lb. per sq. in.: the suction, therefore, cannot be greater than 11lb.—Yours faithfully, J. S. DINES.

**Keeping a Accumulator in Condition when not in Use.**

Sir,—May I be permitted to make a suggestion in answer to "W.B." on page 415 of your issue of Nov. 15th? I note you say that an accumulator which is not likely to be used for some time can be emptied of acid, and water put in, and the cells can then be kept for any length of time. I would suggest that instead of doing this the plates be soaked thoroughly in a diluted solution of soda and water or diluted solution of ammonia, so as to ensure their throwing off all the sulphuric acid they may contain. Unless the plates have got rid of all the acid which they may have had at any time the result will be, after a short time, sulphating on the outside of the plates, no matter what liquid is in the cell. It is true that accumulators can be left with water in, after having been fully charged, for a week perhaps without doing any damage; but it is a very bad practice to leave them any length of time in this state, unless, as I have said, they have been thoroughly washed out.—Yours faithfully, S. WATSON.



**A ROAD INCIDENT (I).**  
Miggs, after having questioned the carrying capacity of his carriage

O.P.U.

### Carbonised Deposit in the Cylinder: Is it Injurious or Beneficial?

Sir,—I note the frequent statement in your paper that a scale composed of carbonised oil in the combustion chambers of air-cooled explosion engines is a common source of overheating. This statement I am unable to confirm or disprove in actual practice. On consideration, however, of the theory of the internal combustion engine, I fail to see where this supposed disadvantage comes in; indeed, I am prone to believe that such a coating of comparatively non-conducting material is actually a source of increased efficiency in these engines. We know that the internal combustion engine is purely a heat engine; therefore, the smaller the quantity of heat lost by conduction through the cylinder walls the more efficient will be the engine. Furthermore, the poorer the conductive properties of the internal surface of the cylinder walls the cooler will those walls remain. If we could explode our mixture in a working cylinder constructed of a perfect heat insulator, and in which we could expand the products of combustion to such an extent that they passed in to the exhaust at a temperature not exceeding that of the surrounding atmosphere, then all the heat evolved by combustion would be available for the performance of useful work upon the piston. In view of the foregoing remarks it seems reasonable to suppose that the greater the wall area covered by a heat insulator the more efficient and cooler will be our engine. On the other hand, however, we have to take into consideration the fact that heat, which in a clean cylinder would be conducted away through the walls of the combustion chamber, will in a foul cylinder remain, to a certain extent, to be conducted away by that area which is swept clean by the reciprocating motion of the piston; but as the gases cool

through one degree centigrade at every increment of 1-273rd of their volume, this drawback should not be so serious as it at first sight appears. Under the varying conditions obtaining when driving an engine along a road I find it impossible to arrive at any definite decision as to whether the clean or the foul engine is the most efficient, but a true understanding might be arrived at by subjecting an engine with a clean and then with a foul combustion chamber to a series of careful brake tests when under known conditions of cooling, and by measuring the quantity of heat lost in the exhaust gases in a suitable calorimeter. With regard to the face of the piston there can be no two opinions; let it remain foul within reason, for we want to keep it as cool as possible, even at the expense of other parts of the engine.—Yours faithfully,

D. G. W. HUME.

Germiston, Transvaal.

### Air Vent to Crank Chamber.

Sir,—On page 327 of your issue of November 1st is a contribution describing and recommending an air vent to the crank chamber of a motorcycle, the object of this vent being to avoid the forcing out of oil to the injury of the belt, the rider's clothes, etc. Permit us to point out to your contributor, as also to your readers, that the device he describes is a feature of all Quadrant motors, and is the subject of letters patent of which we are the owners. We presume that the writer of the article was unaware of the patent rights, so we wait the favour of his reply in your columns.—Yours faithfully,

THE QUADRANT CYCLE CO., LTD.

### The Exhaust Valve Lifter.

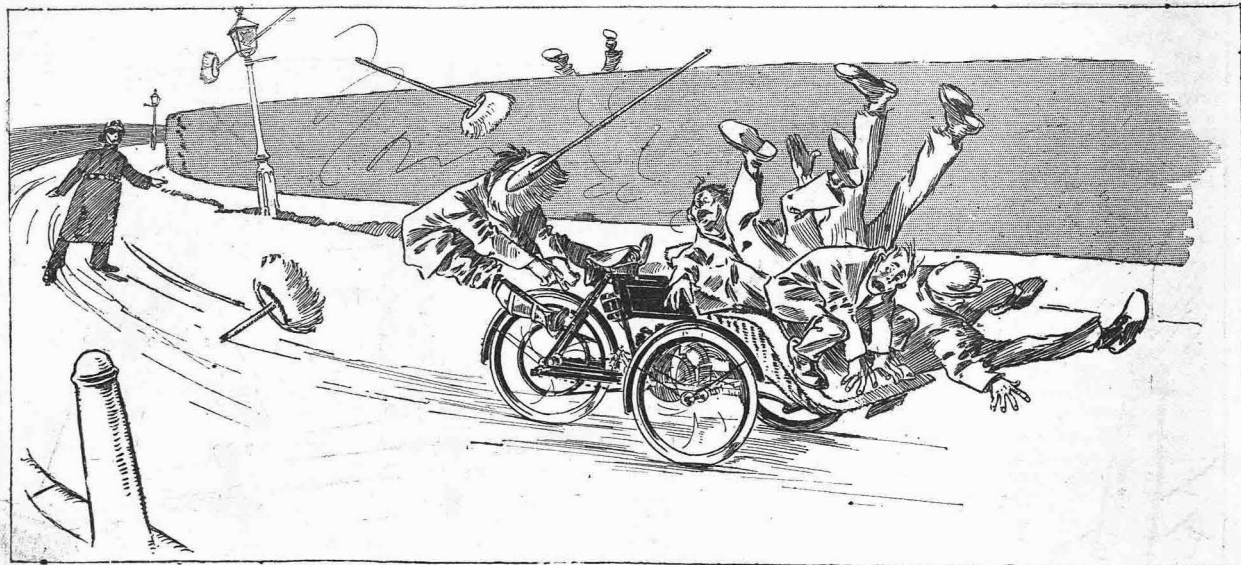
Sir,—As regards regulating the speed of a motor with the exhaust valve lifter, either the exhaust valve is lifted or it rests on its seat, and there are no intermediate positions. When not lifted the motor will work; but if lifted, no explosions can occur except perhaps in the exhaust. The error probably arises because the exhaust valve lifter is usually attached to the ignition lever, and this lever is wrongly spoken of as the exhaust

valve control instead of the sparking control. Induction stroke.—Why this term ever came into use it is hard to say. "Induction" has hitherto been purely an electrical term, and it is a great pity to give it other meanings. "Suction stroke," I think, sounds better, and has hitherto always been looked upon as a satisfactory term amongst engineers. Overheating.—Quite by chance I have found that most of my troubles have been due to the holes in the exhaust having been gradually filled up with burnt oil and dust, thereby becoming smaller and smaller, but the holes appeared to be perfectly clean-cut and clear, and the burnt oil was indistinguishable from the iron. By cleaning them out with the tang of a file they have become about twice the diameter. Accumulators.—One point hardly known outside the electrical profession is that acid-spraying troubles become almost non-existent if an  $\frac{1}{4}$  inch layer of ordinary paraffin oil is poured on top of the acid. Corrosion of terminals would then be a much less frequent source of trouble. Another most useful point is to buy a short length of  $\frac{3}{8}$  in. rubber tubing from a chemist; cut this into the required lengths and slip these over the terminals and corks. It greatly improves the appearance of the cell, besides fitting it better for its work;  $\frac{1}{4}$  in. lengths would be best for the corks. Trembler coil.—The spring which holds the armature back from the core should be stretched so that it barely causes the armature to touch the stop. By doing this, I have reduced the current required to work a coil from 2½ amperes to half an ampere, and two amperes often was not enough to work it. Then there should also be a space between the trembler and the armature, so that the armature hits the trembler a blow. If they are in contact the magnet has to pull the trembler as well as the armature, so that more current is used. By the addition of a yard or two of thin iron wire, the required length being found by trial, the current can be kept very low and the coil will work very steadily.—

Yours faithfully,

A.M.C.

India.



A ROAD INCIDENT (2).

had no doubt on the subject after striking this crowd!



## OUR INFORMATION BUREAU

### SPECIAL NOTICE.

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

1. Plain writing. Type writing for preference.
2. All letters to be written on one side of the paper only.
3. Questions to be clear, terse, and to the point, without tedious preamble or needless flattery.
4. Should an immediate reply be required, an envelope must be enclosed bearing a penny stamp, and the name and full address of the sender. NOT a stamped undirected envelope.

Can any reader inform A.E.D. (Ilford) the exact gradient of East Hill, Colchester?

W.R.Y. (Moffat).—The best combination would be an N.A.B. spring seat pillar, Brooks' spring saddle, and spring front forks.

G.H.Y. (Sutton-on-Sea).—If your carburetter is one of the surface pattern it may simply be that you have the vaporiser flooded. If you will run some of the petrol off the engine may start. Other possible reasons for failure are loose connection somewhere on the wiring, cells run down, sparking-plug fouled up or cracked, inlet valve sticking, or contact breaker not properly adjusted.

L213 (Merthyr Tydfil) writes:—A joint of the petrol pipe of my motorcycle leaks. I have tried packing it with various things, but it is of no use. Can you tell me what would be the best thing to stop it?—Presumably the leak occurs at a union or connection. A rough sketch would have assisted us in suggesting a remedy. A thin washer made of cork or wash leather, fitted in between the surface where the leak occurs, should stop it.

### Exemption from Revenue Tax.

Business writes:—I am a clothier and outfitter with a branch shop, and have recently purchased a business car, which I use to convey goods to and from my branch, to go out in to buy and take orders, and for general use. I shall be glad to know if it is necessary to take out a carriage license: if not, is it necessary to have my name and address on the car? I, of course, have the registered number on and hold a driver's license.—If you can satisfy the revenue authorities that the car is used solely for business purposes, it will be exempt from the tax. It will be necessary to have your name and business address painted on the car. You could obtain the exact particulars from the local revenue office.

Ao,777.—Yes, you could fit an extra air inlet with advantage, and also open up the silencer by making more holes in it.

Oxford Cycle and Motor Co.—We advise you to write the United Motor Industries, Ltd., 45, Great Marlborough Street, London, who are agents for the Longuemare carburetter.

Driver (Bothwell).—(1) Your best plan would be to enquire from the secretary of one of the local technical schools if they have classes in motor construction and driving. (2) Wages vary according to capabilities, and also to size of car: £2 a week is a good figure.

### A Water-cooling Problem.

N. Stark (Plumstead) writes: I have a motor quad with water-cooled head; engine 80 mm. by 85 mm., fitted with the Dupont two-speed gear. The water tank holds about two gallons, and works from the top of the head, through the radiator, to the top of the tank and then to the bottom of the tank direct to the bottom of the head. The radiators run underneath the tank, and are in two rows, about 2 ft. of gilled tubing joined together with square ends. Do you think this sufficient for effective cooling? If not, how much water should I carry; what should be the length of the radiator; and also the bore of the outlet and supply pipes? After about 20 miles the water boils: I thought that if I carried the water through some rows of radiator to and from the engine it might keep cooler.—You require to provide at least three times as much radiating surface as you have at present. This should be placed in a good position to catch all the draught possible. Avoid sharp bends in the tubes, and take the inlet tube to tank at about two-thirds up. This should give good circulation. Do not use a less diameter tube than  $\frac{3}{8}$  in. inside. Two to three gallons of water should be ample.

B2 (Halesworth).—Your gearing is much too high. Remove the engine pulley and fit a new one, which must be not more than  $3\frac{1}{2}$  inches diameter (edge to edge).

Side Slip (Cheshunt) writes:—I have a  $2\frac{1}{2}$  h.p. motorcycle fitted with Dunlop motor-bicycle tyres, 2 in., and as I am troubled with side-slip, I shall be glad to know of any device I could have fitted to the rear wheel.—Parsons Non-Skid chain should suit you, or the patent non-slipping rubber tread as made by R. S. Lovelace, Henstridge, Somerset.

H. Lane (Plymouth).—We do not advise you to attempt to repaste the grids. It is work requiring experience to do successfully. As it also appears as if one of the connecting lugs had broken, we should say that on the whole it would not pay to repair the cell. It is the vibration affecting the grids which causes the oxide of lead to drop out. In first-class makes this cannot occur, as the grids are specially designed to hold the paste securely. Get a new cell: you can charge it perfectly well at 110 volts through a 32 c.p. lamp; or two connected in parallel would do the charging quicker.

### Oldsmobile Car.

H.J.S. (Waldringfield) writes:—I have removed a 4-volt accumulator from my Oldsmobile car, and placed in its stead a 6-volt one. There is an improvement in the running of the engine, but I notice a continuation of sparks being thrown off from the brush. Will you kindly state the reason and if any effect will result?—The sparking may be due to insufficient pressure between the brush and the contact ring. It is just as likely, however, that six volts passes rather too much current for the coil, and you would have to reduce this by means of a wire resistance inserted in the primary circuit.

### Misfiring in Two-cylinder Car Engine.

Xenophon (Leamington) writes:—I have a two-cylinder car which pulls well as a rule, but occasionally one cylinder will misfire persistently for a mile or so, and after that will fire quite regularly. I have a double trembler coil, and a 40 ampere-hour accumulator. I am pretty certain that there is some slight defect in the ignition, but I cannot locate it. I have tried a new plug and examined the wires and cannot detect any signs of a short circuit. Could you give me a hint where to look for the fault?—You might go over all the connections on the wiring and see if there is not a loose contact somewhere. One of the brushes or springs of the contact maker might be a trifle weak and require setting to press harder on the disc. Another reason may be that you get temporary fouling of the points of one of the sparking-plugs immediately after lubricating the engine. You could use an oil-proof or protected plug in this cylinder with advantage.

## LIGHT CAR EXPERIENCES WANTED!

During the past few weeks we have received an exceptional number of letters from subscribers, asking for the driving and other experiences of readers, and also regarding the cost of running and the upkeep of two-seated cars. We shall be pleased to publish letters on this subject and upon general experiences, but we would ask correspondents to write as much to the point and as briefly as possible.

## BUREAU.

W.R.C. (York).—The glycerine and water anti-freezing mixture is fairly efficient, but it makes a nasty mess of everything it comes in contact with.

H.C.D. (Portland).—We do not advise you to convert your 2½ h.p. motor-bicycle into a three-wheeler. You require a good 2½ h.p. for the work, even with one passenger only.

L. G. Fox (Filstead).—We should not advise you to attempt fitting the 2½ h.p. engine on an ordinary cycle frame. You could buy a good frame, such as a Chater Lea or Eadie that the motor could be adapted to.

### Registration Number.

H.M. (Leeds) writes:—In July last I hired a motorcycle for a week's tour and I registered it so that I have now a number but no machine. I am at present purchasing a second-hand mount from a friend of mine which, of course, has its number. I should like to have your opinion as to whether there is any necessity to keep my friend's number after registering the transfer? I know it is usual for the number to go with the machine, but I do not know the legal view of the matter. I am also having a new tyre and treads put on. The machine is a 1902 Quadrant, 2 h.p. with twisted belt, and I should be glad if you will advise me on the subject of tyres and treads, as my pocket is somewhat limited.—(1) The original number you had cannot legally be affixed to the second-hand machine you are purchasing. But you can have this number transferred. A Smith's or Bates' non-slipping band vulcanised on each tyre should make them quite serviceable. You could solution the tread on the tyre yourself, but it would not be so satisfactory as vulcanising.

### Coil Queries.

Coil Struck writes:—(1) I was starting my machine on the stand recently when it suddenly misfired badly. Everything was overhauled, and finally the coil was found to be giving the trouble. I had another fitted, so I connected this up, and the motor went well. I then took the oil coil to pieces, and I found that all the secondary winding was bare wire, except the outside layer. (I might say that it has never had more than four volts through it.) How could a coil in this condition give a spark at all? (2) How can such a fine wire as the secondary is made of stand such a great pressure (which is said to be thousands of volts) without burning up? (3) How is it that if a small electric motor or lamp be connected between the secondary winding, it will not work or show any signs of the great pressure going through it?—(1) It is not uncommon to come across a Continental made coil wound with bare wire. It is run on to the coil with a thread of cotton or silk alongside to separate the turns: providing the turns are kept apart it answers just as well as covered wire, but occasionally the turns short-circuit, and give trouble. The idea, of course, is to cheapen the manufacture. (2) The explanation is that although the voltage is very high, the current is extremely small; a very small fraction of an ampere, in fact: pressure is not the same as current. (3) The resistance of such a great length

of fine wire is so high that it is impossible to force enough current through it to light a lamp.

Pivot (London, N.).—The red splashes on your motor jacket are most probably acid stains from the accumulator. Get some strong ammonia and touch the spots with it. They will disappear if they have not been left on for long.

AP540.—(1) In a surface carburetter you will find by experience the best depth of spirit to keep in the vaporising compartment: this requires refilling from the tank occasionally to make up for the amount vaporised: the float will indicate approximately when this is required. (2) No, the oil tap in the crank case must be closed when running; otherwise the oil would get blown out as fast as it was pumped in.

I.N. 28 (Killorglin, co. Kerry).—The sketch of wiring sent marked "B" is correct. Your description of carburetter is clear enough, but it seems to be a modified F.N. Spirit should only flood over when plunger is depressed for starting. Grind in needle valve of float very gently with just a smear of crocus powder and oil (not emery powder). You should cut off all the auxiliary air at starting, and gradually open air inlet until engine beats regularly. We do not recognise the mark on the coil.

### Fault with Small Engines.

Compression (Woodford).—We should not advise you to fit the surface carburetter you refer to. The trouble with your engine is obviously leakage of the charge past the piston. When you fit new rings, and get them worked in, the engine should go better than it does now. The cylinder is so small that you will have to have high compression to get any power. You can either fit a ball valve or drill a 1-16 in. hole through centre of shaft as an air release. The power, if the engine is in first-rate order, would be 1½ h.p. A drawing of the interior of a surface carburetter appears in our "Manual." You will find the book very useful.

### Exhaust Pipe on Car.

Simplex (London, N.W.) writes:—I have a small car of good make, and I was somewhat startled the other evening to observe the exhaust pipe red-hot from close up to the engine right along to the silencer. I had previously been running the car for a mile or two on the middle gear, but I can scarcely think that this would cause the overheating of the exhaust pipe. It happens that the carburetter is almost in a direct line with the pipe, and as there is always the possibility of a small quantity of petrol dripping, would it not be liable to catch fire if it came in contact with the pipe, and thus, perhaps, destroy the car? What can I do as a remedy?—The pipe should not get so hot unless the exhaust is throttled in some way. It is just possible some of the silencer holes are blocked up with mud or burnt oil. On the slow speed it is important to use the minimum of gas. It is possible that you do not throttle down enough. See that the exhaust valve is all right, and that it lifts the full amount and that the circulation system is in good order. If any petrol does drop on a red-hot pipe it would certainly ignite. Could you not rig up a screen out of a piece of sheet metal and place this below the carburetter. This would keep any petrol from dripping on the pipe.

### Car Query.

S.C.M. (Manchester) writes:—The only trouble I have with my small 6½ h.p. car is that the water boils away rapidly. There is no leakage as far as I am able to detect by a casual inspection, and the pump seems to work well. Could you suggest a possible reason for this difficulty.—(1) The circulation may be sluggish, due to an obstruction in one of the pipes. (2) The engine may not be in as good condition as it should be as regards compression, and thus you use an excessive quantity of gas. (3) Your driving may be at fault. For instance, if you use the low speeds too much the engine will race and get exceedingly hot. Keep on the top speed as much as possible.

[Correspondents are requested to keep their queries as brief and concise as possible. The great and quite unnecessary length of many of the communications sent in preclude the possibility of them being dealt with promptly.]

### ANSWERS BY POST.

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

Wednesday, November 16th.—W. R. Coates (York), H. Ball (Paignton), B. W. Bradford (Banbury), H. C. Dorner (Portland), A. Bloomfield (Woodford), H. Dewy (Watton).

Thursday, November 17th.—C. Christie (Sheffield), B. Howlett (Kingston), H. Marston (Ilorton), T. H. Smith (Stretford), H. Mawson (Carlisle), R. H. Edwards (Birmingham), P. Taylor (Shaftesbury), S. Weatherhead (Luton), J. Reid (Norbiton), F. Daw (Ebbw Vale), A. J. Sheen (Aberdare), A. E. Tame (Wood Green), C. S. Prentice (Snaresbrook), J. M. Hotchkiss (Brampton Junction), Ortona Motor Co. (Egham), W. Mitchell (Leith).

Monday, November 21st.—B. H. Sellis (Hartlepool), A. Edmonds (Mitcham), W. Finlay (Larne), A. Stelfox (Belfast), P. F. Garnett (Chester), J. Tabnum (Lee), P. H. Dodds (Birmingham), C. Ackland (Bournemouth), D. Godfrey (Dundee), Cardus Bros. (Skipton), J. Neve (Dartford), E. B. Kilen (Belfast), G. Yates (Rushden), N. Dingley (Cradley Heath), J. Howard (Cambridge), S. Weatherhead (Luton), T. C. Smith (Be two-y-Coed), C. G. Kent (Brixton), H. N. Edge (Bilston), C. H. Fyne Clinton (Blandford), R. Vaughan (Merthyr Tydfil), P. A. Revel (London), E. D. Dewdney (Kingskerswell), F. Grant Allen (Chatham), H. E. Wix (Westcliff), O. Gardner (Blaina), A. M. Smith (Navan), G. B. Page (Norwich), M. Lindsay (Repton), H. Svidenham (Salisbury), G. Head (Nottingham), C. R. James (Teddington), A. F. Hotopi (Sydenham).

Tuesday, November 22nd.—J. Ietch (Brentwood), M. De Cordova (Uppingham), H. Ball (Paignton), H. Brown (Hull), A. Mannall (Cawood), E. Guthrie (Liverpool), E. Southworth (Clitheroe), C. Swithuban (Denham), J. Wardle (London), T. W. Padfield (Bristol), P. Davison (London), M. Oliver (St. Boswells), O. Smoothy (London).