THE AUTOCAR

A Journal published in the interests of the mechanically propelled road carriage.

EDITED BY H. WALTER STANER.

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The Show Question.

Last week we recorded the fact that the Automobile Club had decided to grant its patronage to the show to be held at the Agricultural Hall. patronage has been sold for £500, and the selling of the club name is, in the minds of most, far more serious than the fact that it has reversed its decision of less than two years ago-that it would not grant its patronage to any show till the members of the home industry had decided to support one only. This question of one show only has been a burning subject at different periods, and although it is perhaps as far from settlement as ever, there is no doubt that the Crystal Palace exhibition has been obtaining a more and more preponderating lead each year, and last year it was the more important exhibition, and it will be again this year. Consequently

the bestowal of the club patronage upon the less representative show has endowed that with some new vitality, and the result is that the settlement of the question is farther ahead than ever. Sentimentally, we are pleased that the Agricultural Hall exhibition has once again secured the backing of the club, and should be glad for it to retain it, because its promoter was the first individual having the pluck to organise and hold a motor show; but, leaving sentiment aside, and looking at the matter impartially, there is no doubt whatever that the club has not only sold its name to the less important exhibition, but it has also postponed anything like a settlement of the show question. It appears to us that the interests of the user and the maker are entirely at one in this matter. The maker does no: want to waste his time and money at two exhibitions when one will suffice, and the user is in precisely the same position. He wants, if possible, to see all the new cars of the year, but he does not wish to make two pilgrimages at a month's interval-one to Sydenham and another to Islington-before he can satisfy himself that he has seen all that there is to

The Club's Prestige.

We would be the last to impute unworthy motives to the club committee, but it seems to us that in their anxiety to increase the club income they have forgotten the more important matter-the club prestige and reputation generally. There is no doubt that the club patronage is a useful asset. Whether it is as valuable as some people believe is open to question, but if it is to be sold to those who will pay for it it will very shortly carry no weight whatever. As it is still of some value, it is not unreasonable that the club should have some profit from the show to which it gives its name, but if it can only be done by the sale of patronage we can only say that for the sake of the reputation of the club this source of income should be foregone. Not only so, but by this ill-considered act the club has practically ranged itself with one section of the trade against another-an act which is most certainly unwise in every respect. It is clear that the club committee considered that some explanation of the position they have assumed towards one show in preference to the other is due to the public, and a statement has been sent out to the effect that any moneys coming to the club as the result of that patronage, and after the payment of expenses, should be allocated to promoting dust prevention, side-slip trials, toads resistance investigations, and to any other purpose that may prove of general usefulness to the movement, as apart from the social organisation of the club. After the fierce light which has beaten upon the club's action in this matter in the columns of the press, it was not to be supposed that the money so acquired could be ostensibly employed for any other purpose than the promotion of the automobile movement in one sense or other. But we

cannot conceive that anything which may result from such tests as are mentioned can possibly counterbalance the immense harm that the club has undoubtedly done itself in the eyes of the automobile world by this very mistaken action.

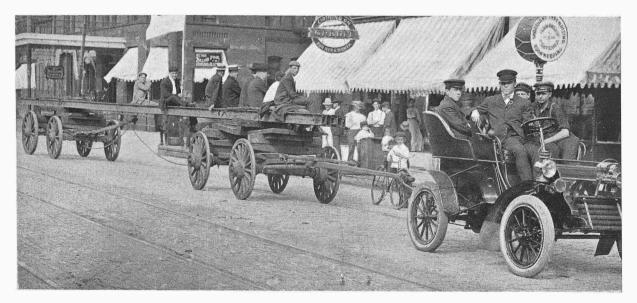
The Autocars of 1904.

We are continually receiving enquiries from readers asking us where they can obtain a compact list of the cars of to-day, and they very frequently ask the difference in price between two or three makes of about the same power and general specification. As this is the case, we have decided to compile a list of the cars of 1904, and we already have the particulars of the majority of makes. As we want our list to be as complete as possible, we shall be glad if makers who have not already furnished particulars will do so. The information required is as follows: Horse-power, name of car, number of cylinders, diameter of cylinders, length of stroke, revolutions per minute at which horsepower claimed is developed, transmission (chain or gear), number of speeds, number of seats, weight unladen with standard type of body, price in \mathcal{L} 's, name of firm and address. As the list will be published next week it is necessary for details to be sent immediately to ensure inclusion.

The Weight of Railway Motor Cars.

Over a year ago we suggested the advisability of railway companies turning their attention to motor vehicles running on rails for use on main or branch lines for the convenience of light local traffic. We pointed out that such vehicles would be particularly useful in cases where (τ) the traffic was not very heavy, but where the necessity existed for a frequent service, and (z) upon branch lines where the traffic was light and infrequent. Quite a number of companies took up our suggestions, and others who have, as yet, made no public move in the matter are considering it carefully. At the same time it

appears to us that the lines which are being followed. so far as the construction of the vehicles is concerned, are scarcely what they might be. In other words, the vehicles are very much too heavy. To take a case in point, a motor railway carriage designed to carry fifty-two people weighs thirty-three tons empty, or over twelve hundredweights per passenger. The speed of the vehicle does not exceed thirty miles an hour, and the car runs upon rails, which are far better than the best high road ever made. When we turn to the autocar we find plenty of machines which will carry four or five people comfortably on a give and take highway, up and down hill at the same speeds as the railway cars, while the vehicles themselves weigh well under a ton, that is to say about four hundredweights per passenger. We do not suggest that the constructors of railway motor cars should follow the necessarily costly practice of the motor car builder, but at the same time it appears to us that there should be a middle course between the excessive heaviness of the railway carriage and the extreme lightness of the motor vehicle. As it is, energy, and consequently money, are being wasted in starting and stopping these needlessly heavy loads. It should be clearly understood that we are not suggesting undue cutting down of the weight of the vehicles, but when we see the very hard use which the comparatively light motor car endures upon the road, it is obvious that the railway equivalent is needlessly heavy, though it is better for it to be a great deal too strong than that it should have the faintest suspicion of weakness or insecurity. There is no doubt, however, that a good deal of the superfluous weight of the present type of railway motor carwhich, by the way, is only experimental-could be climinated without materially affecting the margin of public safety. In other words, the constructors have apparently not yet fully realised that weight and strength are not necessarily synonymous.



A LAND TUG. The above illustration depicts a 5 hp. Cadillac car towing two trolleys, on which is loaded a quantity of structural steel. This photograph is interesting, as showing the use to which motor cars are occasionally put under the press of circumstances; while it also demonstrates the reserve of power which many cars possess.

USEFUL HINTS AND TIPS.

An Effect of a Six-volt Current.

It is not unusual to find the high-tension ignition systems of some automobiles embracing alternative sets of three two-volt accumulators, which, when the cells are well charged, cause a current of between six and seven volts to pass through the primary wiring of the coil. This current, of course, affords a fine fat spark, but we have lately found it to possess at least one disadvantage. It causes the platinum contacts on the trembler screws and blades to become pitted by burning much sooner than when a four-volt current is used, and as in our case the engine fires quite as well with the spark induced by the four-volts current as with the six, we have disconnected the third cell in each case, and have now three sets of accumulators in lieu of two as heretofore. There is a gain in this, as should some evil fate bring about the shorting of both working sets of accumulators—which is not altogether outside the bounds of possibility—there is still the third unconnected set to fall back upon.

To Stop Rattling.

A frequent source of rattling on a car is loose connections on the various rods which are connected to such parts as the sparking advance, throttle valve, etc. Such joints are frequently made by simply bending round the end of the rod, passing it through the eye of the lever-or the part which it is intended to actuate- then putting a washer over, and fastening by means of a split pin. Needless to say, this is more or less a rough job, and is bound to lead to a great deal of rattling sooner or later. This may be overcome, however, by placing an indiarubber washer between the steel washer and the bent portion of the rod. This keeps the joint up a little tighter, and at the same time gives it free movement and prevents it rattling. The same remedy could, of course, be applied to any other parts or joints where it is possible to introduce a rubber buffer or washer without displacing any vital portion of the mechanism.

A Dangerous Practice.

May I give a word of warning in your columns against the dangerous practice by inexperienced motorists of leaving their cars unattended with the engine running and the gear in mesh? I witnessed this reckless proceeding very recently. driving a 7 h.p. Panhard on to the Old Steine Square at Brighton, stopped the car by applying the outside brake, then left the car without throwing the engine out of gear or reducing the speed. The chauffeur in attendance also left the car. Upon his return I remarked upon the dangerous practice mentioned, and was rewarded with a vacant stare of apparent incomprehension. There is quite enough antipathy against motors without having this enhanced by careless or ignorant people who run such risks. It is not a common thing for a motor to run amok, but I have had an experience of the kind with a similar car, when the side brake lever slipped out, letting in the clutch, and only the fact of my standing beside the car at the time avoided a terrible accident.—C. R. EARTHY.

Driving on Treacherous Roads.

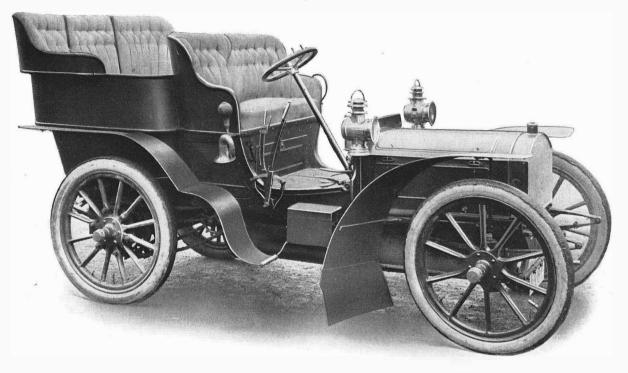
As a natural consequence of the extremely bad weather which has been experienced almost generally during the whole of the past year, the roads are for the most part in such a slippery condition as has never before been experienced for so long a period with only slight breaks. It is natural, therefore, that an extraordinary amount of sideslipping should have taken place. There is no doubt that had it not been for a fairly extensive use of such anti-skidding devices as are now on the market the number of accidents recorded would have been comparatively high. Those who are unfamiliar with the gyrations of a motor car under the influence of side-slip are often at a loss to know what to do when the car begins to glissade even in a gentle manner. Now, as a matter of fact, side-slip is one of those things which comes upon one suddenly; but if a number of such side-slips are analysed they will be found to be due to a too harsh application of the brakes, or to the upward changing of the gears when the conditions are such as not to permit of the road wheels taking up the increased speed applied to them and at the same time getting a firm grip As a general rule, it will be found, of the road. if one drives on one's proper side of the road, that the tendency of the car is to slip towards the near or left-hand side, this being due to the camber of the road, so that the rear wheels of the car have an inclination to slide upon the greasy surface down to the gutter. On some of the narrow and highly cambered roads occasionally met with there is the greatest difficulty experienced in keeping the car straight. The natural inclination is for it to proceed crab fashion rather than in a straight line.

Some Good Advice.

Under such circumstances we consider it better to wait until the way is clear, when the car can be put directly across the road and again brought on to the crown, when all will go well so long as the crown of the road is kept to. Under other circumstances, when the car shows an inclination to slip towards the left, if the front wheels are also steered towards the left they have a wholesome checking influence upon the rear wheels, which, once having commenced to slide, prefer to take the front wheels as a pivot whereon to turn, and if the pace or the weight of the car and the general conditions are such as to give sufficient momentum, it is not at all unusual for the car to turn completely round. In such instances the checking influence of the front wheels is not very great, but is frequently sufficient to prevent the car doing any serious damage to itself. If, on the other hand, the wheels are turned outwards, they only aggravate the sideslip by causing the driving wheels to push the front of the car more up on to the crown of the road, so giving sufficient momentum at the rear end either to turn the car itself completely round, or possibly to seriously damage the rear wheels or axles by a violent collision with the kerb. Such occurrences are nerve shattering in a degree, but it must be remembered that with practice comes confidence and skill. enabling one to instinctively check side-slip.

THE GERMAIN STANDARD CAR.

FOUR-CYLINDER ENGINE, 95MM. BORE, 130MM. STROKE—LIGHT BRASS WATER JACKETS RIGIDLY AND MECHANICALLY SECURED TO THE CYLINDERS—VARIABLE INLET VALVE LIFT CONTROLLED BY A SIMPLE MECHANISM—EISEMANN SYSTEM OF ELECTRIC IGNITION—SLIDING TYPE CHANGE SPEED GEAR—TRANSMISSION BY COUNTERSHAFT AND CHAINS TO THE ROAD WHEELS—WHEELBASE 7FT. 94IN.



The 16 h.p. Germain Standard Car.

The accompanying illustrations and diagrams will serve to give our readers a clear idea of the lines upon which the 16 h.p., 24 h.p., and 35 h.p. Germain cars for 1904 are constructed. These cars can now be seen finished to take the road at the Germain Company's London depot, 1, Hanover Court, Hanover Street, W., where Captain Theo. Masui takes pride in demonstrating what are really very highly-finished vehicles.

The Chassis.

Primarily the frame is of wood, stiffened by steel flitch plates, cambered along their upper edges to give the maximum of strength with the minimum of weight. The camber of the frame is carried up within the body of the car. The wood and steel chassis has been adhered to in preference to a stamped steel frame, on account of its special flexibility and the facility of repair in case of accident. The frame is carried fore and aft by long and easy springs, which are connected to the rear dumb irons by long links. The artillery wheels are 910 × 105 mm, over tyres, and, as may be seen from the plan, the steering axle is set right forward, a wheelbase of 7ft, 9¼ in, being thus afforded.

The Engine.

The 16 h.p. four-cylinder engine, carried by its aluminium crank-chamber, is supported on an under-

frame formed of angle steel, the disposition of which can be observed from the plan given on page 120. Each cylinder is separate, and is bored and turned directly from a steel forging. The water jackets D¹ D¹ to the upper parts of the cylinders are formed of deep-barrelled brass collars. The edges of these collars are spun into chases prepared for them in the cylinders, and steel rings are subsequently shrunk on over the joints. No solder is used. The cylinder heads D D forming the combustion and valve chambers are of cast iron, cast with their own water jackets, the valve chambers being all on one side of the engine, so that one half-time shaft alone is necessary. Each cylinder head is bolted to the steel cylinder by means of the flanges shown in the vertical section of the engine (fig. 4), four bolts being used for this purpose. Both induction and exhaust valves are most readily accessible, it being only necessary to unscrew the nut from the stud over which the valve dog slips to get at any pair of valves. A particular feature of the Germain engine is that, in addition to the throttle and ignition control, the lift of the induction valves can be varied in a simple, but nevertheless ingenious, manner. The valve-rising rods are provided as to their upper ends with screwed caps, the thread thereof being of coarse pitch, and these caps, being capable of partial rotation by means of a right-angled lever and the draw bar seen in fig. 1, the lift of

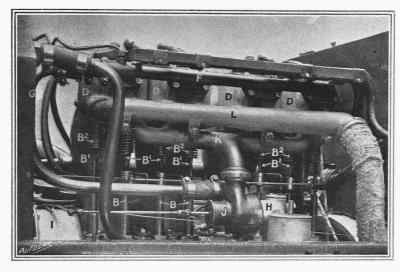


Fig. 1 - Germain engine, left-hand side.

B B, valve lifter guides B¹ B², valve stems B² B², valve springs D D, cylinder heads

F, water nutlet pipe G, cellular radiator H, carburetter I, governor (in case)

J, governor throttle valve K, inlet pipe L, exhaust pipe

the induction valves can be varied from half to full lift at the will of the driver, the valves being controlled from the centre of the steering wheel. The manipulation of the ignition, throttle, and valve lift gives the most perfect control of the engine both when running light and loaded, so that the motor is under both circumstances as nearly noiseless as may be.

The carburetter is of special construction, designed to vary the volume of mixture automatically with the needs of the engine. This carburetter was illustrated and described in The Autocar of January 31st, 1903, page 120. It is provided with a governor carried on the forward end of the half-time shaft, which actuates a piston throttlevalve in the carburetter, and as set cuts out the mixture feed at 800 revolutions. The action of the governor can, however, be restrained delicately by an accelerator pedal from the footboard whenever it is desired to race the engine more or

The Eisemann high-tension ignition is fitted, the apparatus being set on the right of the engine forward, the magneto being driven by gearing off the engineshaft. The sparking plugs are set in the crown of the combustion chambers. High-tension ignition is also fitted, and, as evidence of the remarkably quiet running of the Germain motor, we may say that the engine runs quieter under the Eisemann than from the accumulators, as the tremblers from the four coils are, of course, not then heard. The single trembler on the Eisemann excited coil appears to be noiseless.

With regard to the water circulation, this is maintained between the cylinder jackets and the honeycomb radiator by means of a centrifugal

gear-driven pump. The draught is induced through the radiator by the fan-shaped arms of the flywheel and friction clutch, the engine being enclosed by the bonnet and aluminium apron.

The Transmission System.

The drive passes from the engine, through the large flywheel and clutch, chauge-speed gear, countershaft, and chains, to the road driving wheels in the usual way, the gear affording four speeds forward and reverse. The gear box, as may be noted from the plan, is not carried on the underframe, but is slung from three points. It is supported in front by a universal joint from the transverse angle steel member in rear of the engine. and behind it is suspended from the countershaft by the bearings on the countershaft on each side of the differential gear. Three inspection lids.

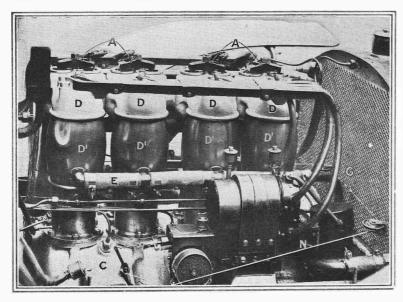


Fig. 2.-Germain engine, right-hand side.

A A, dogs holding down valve D1 D2, cylinder water jackets, G, cellular radiator brass M, rotary magneto machine On boxes D.D. cylinder heads E, water inlet pipe

N, sparking control wire be-

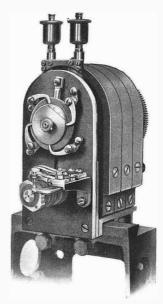


Fig. 3 The Eisemann ignition apparatus. This shows more of the details than are seen in fig. 2.

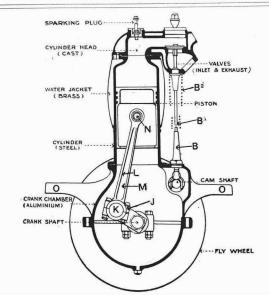


Fig. 4.-End section of the Germain engine

B B, valve lifting rods guides B¹ B¹, valve stems B², valve springs J, crankshaft K, crank spindle

L, connecting rod M, big ends N, gudgeon pin O O, supporting brackets

detachable by unscrewing a butterfly nut, are provided to the gear box. From the first illustration it will be noted that the steering standard is raked smartly back to bring the wheel well and comfortably under the driver's hands. In the centre of the steering wheel is a circular ratchet plate which takes two small levers, one controlling the advance of either ignition, and the other the valve lift referred to.

Lubrication to all working parts is maintained from a Dubrulle lubricator, the force pump of

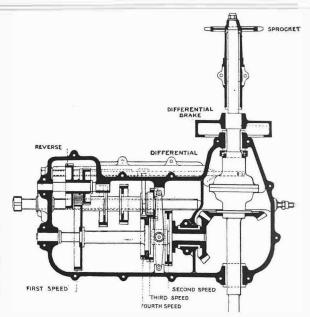


Fig. 5.-The Germain gear.

which is belt-driven off the engineshaft. Two pump lubricators are placed on the dashboard—one for extra lubrication to the engine and the other for paraffin. The gear-box bearings are fed from a large forced feed lubricator on the dashboard. The dual ignition switch is also on the dashboard.

The 16 h.p. Germain, for design and finish throughout, can vie with any first-class automobile now before the public, and the care and thought evidently expended in its construction throughout must delight the heart of every automobilist who takes pleasure in sound, careful, and ingenious work.

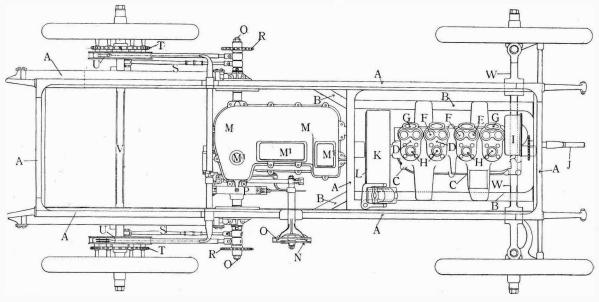


Fig. 6.-Plan1 the 16 h p. Germain standard car-

A A, frame wood and steel flitch plates A² A³, steel flitch plate B, underframe angle steel C C, crank chamber D D, cylinder heads D² D³, cylinder harrels steel D², brass water jackets G G, water inlet I, governor box

K, liywheel
L, (riction clutch
M, gear box
N, gear sector
N's, gear changing lever
Q, side brakes tever
Q's side brakes gear
P, band brake on countershaft
P', brake pedal

Q, countershaft
S, radius rods
T, chain sprocket on road wheels
U, back wheel band brake
V, back axle
W', steering connecting rod
X, steering standard
Y steering wheel

WHY NOT MOTOR OMNIBUSES? By H. Barker Lake.

Further evidence of the truth of our statement that a railway laid down in the thoroughfares of the centres of population is a menace to the safety of man and beast was evidenced at Dudley recently, when three horses were electrocuted through a leakage or "earth" from one of the masts carrying the overhead electric wire. The victims might just as easily have been human beings, but because they were horses the accident is pooh-poohed, and any of the public who, reasonably, anxiously enquire are laughed at by those whose interest it is, more or less directly, to uphold the system. There has been an attempt by a Birmingham newspaper to prove that the result would have been only a shock to a person, by asserting that "neither at Brentford, where a broken trolley wire was the cause, nor at Dudley would life have been sacrificed had human beings instead of horses had the misfortune to form the medium through which the errant current went to earth." Possibly, the writer would be less assertive if he came more frequently into contact with even medium-sized generators, or spent a little time in the test room of a large works where the pulling out of a main switch under load might knock the trespasser head over heels or even render him unconscious, without coming into direct contact with a metal surface whilst making excellent contact with their feet on a metal rail which is usually the return

But the chance of a severe shock, or even of being electrocuted without warning, is not the only nor the least danger of an electric railway running down main thoroughfares of big cities. Everyone who rides a bicycle or motor cycle knows the danger of crossing those grooved metal tracks, which is necessary at frequent intervals in busy thoroughfares, and if one is to benefit by cycling and move quicker than a walking pace, it becomes necessary to cross and recross to thread through the traffic. The angle of direction of the wheel to the rail being necessarily small increases the risk, which is again accentuated by the narrow space between vehicles and the central mast or its kerbing; whilst the available space is lessened by the slower and



IN THE HIGHLANDS. A snap shop of Lord Burton's 14 h.p. Daimler, which he has used very extensively when shooting in the Highlands. The car was photographed on the road side between Lorndoun and Clunie, over 1,000 feet above the sea.

heavier traffic being "alarmed" off the tramway track to give up the main portion of the road to the cars, which, moreover, cannot deviate from their course (as we have previously said), and, therefore, block any attempts at more efficient and rapid locomotion, the lack of which, in comparison with Continental cities, has been the lament in this country for years.

Altogether inadequate as the systems of motor omnibuses running in some districts are, still their advantages over a fixed railway are evident to anyone whose mind is not prejudiced. Then there is the great saving to the ratepayer which would result from a thoroughly equipped motor omnibus system as compared with the electrical railway system—nay, even to the cost of pulling up the road and laying down the track-the laying of a single track of standard 4ft. 81/2 in. gauge, not including "bonding," costs about £,6,100 per mile. Take double tracks for a four mile radius from the centre, in only eight directions, and we get £394,000, and for this amount you have only obtained the track, no overhead wires, poles, or fittings, no power station, and above all no vehicles. Taking actual outlays, such as those previously given in our issue of October 31st, 1903, page 541, where the figures for a city's equipment have already run to from £1.000,000 to £3,000,000, and then allowing £1,000 each for a good motor omnibus, three hundred of them in working order will not amount to the same as the mere laving of track for an electric railway, without anything else. Therefore any corporation who installs a motor omnibus system has the balance of the one to three millions in hand-that is taking running sheds and rate per car mile or per passenger mile to be equal-and could therefore afford to have one spare car for every six, and still save some thousands of pounds on a large outlay, resulting in a safe and agreeable system of traction without monopolising the main roads or taking away the beauties of suburban roads. Not only so, but there are the advantages of a quicker service, and of reaching quarters of cities which it would be impossible for an electric railway to serve.



A GOOD HILL-CLIMBER. The 24 h.p. Panhard touring car which recently climbed the Great Orme's flead. This, we believe, is the only car excepting Mr. Higginbotham's 60 h.p. Mercedes to accomplish this feat.

THE NAPIER WORKS AT ACTON.

Under the dual guidance of Messrs. S. F. Edge and M. Napier, we were pleased recently to make a hurried, but none the less interesting, tour of the up-to-date automobile works which have lately risen on the Uxbridge Road, Acton, fronting the Recreation Grounds. The buildings that are already completed—to wit, dwelling-houses for works manager and caretaker, counting-house, drawing-office, stores, main machine shop, foundry, and repair shop—are of the most substantial character, and fitted with every necessary up-to-date appliance and convenience for the very best of work and the comfort of the clerical and mechanical staffs.

The area of the land at the disposal of Messrs. Napier and Son is four acres, and before long this will be fully occupied by the shops already men-

tioned and those in contemplation.

Making first the tour of the main machine shopa fine, extensive, and splendidly-lighted buildingour attention was first drawn to several 16 h.p. fourcylinder Napier engines, inverted and bolted firmly to seatings in large tanks, being run in, as to their pistons and cylinders, crankshaft, big and little ends bearings, by belts driving on their flywheels from overhead shafting for some days with rotten stone and oil. From these tanks the engines go straight to the testing-shop, and the result of their sojourn in the tanks is that the purchaser of the car to which they are fitted finds that his engine runs with perfect sweetness from the moment of purchase. The change-speed gears, with shafts fitted, are run in a similar manner, with a similarly gratifying result, which accounts for the sweet change of the Napier gear.

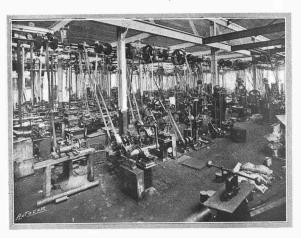
Another great factor in this desideratum is the fact that the gear wheels, which are cut entirely from the sawn blank, have their teeth fashioned by those wonderful automatic tools, the Fellowes gear-shaper. The gear-cutter in this tool is practically another gear wheel, and cuts the teeth of the blank in operation, meshing and rotating with the same as



Boring, shaping, and planing machine tools in the Napier Works.

the teeth revolve. Thus the absolutely correct form and meshing of the driving and driven gear wheels is indubitably assured. Later, our attention was drawn to the fitting of some 12 h.p. crankshafts to

their brasses in the crank chamber, and we can testify to the extreme care taken in performing this operation. Each bearing is most assiduously scraped in, until the red lead test shows most conclusively that the shaft takes a bearing on the whole length



Some of the light work machine tools.

and surface of the brasses. Also, the brasses themselves are previously bedded into their seatings in the aluminium crank chamber in exactly the same way, so that the most perfect and solid bearing humanly attainable is obtained. In this work a three-inch bearing is a three-inch bearing at the time the parts go together finally, and has not so to become only after a few hundred miles on the road. The Napier mechanism is made to "find itself" in the works. Each machine is lock, stock, and barrel trued up to itself, and no time or skill is spared in effecting this most important work. Indeed, all the bearings throughout the car are treated in this manner, and we cannot too highly praise the scrupulous methods adopted.

The Precision of the Work-

Although the utmost exactitude is followed in all the machining, the work all being finished to limit gauges, the fitting up of all the parts is given the greatest care. All lathe work is turned to roughing gauges 1-100in, big, leaving the margin for hardening and grinding. Before the grinding operations are commenced on work, micrometer gauges are used by the operatives to test the exact amount to be taken off.

The surfaces, after the grinding operations are completed, feels like silk of the finest texture, and are, of course, absolutely true to rate of an inch. The camshafts are, with their cams, turned out of the solid forging on one lathe, which has formers for causing the cutting tools to give the correct form to the cams. These are afterwards case-hardened. For the grinding work there are no less than eight heavy grinding tools. All pistons are ground, piston rings being depended upon only as a seat, and not to make explosion-tight joints.

That neither material nor money is spared in the effort to produce the best and most efficient work is instanced by the one fact that the halves of the countershaft, each carrying its differential toothed

bar, the wheels not being keyed on the end of the shaft, as is frequently done. This entails no less than 21/2 in. of material being cut away from the bar for its whole length.

The Methods Employed.

Our admiration was excited by the ingenuity and thought displayed in the design of the various jigs in which the crank cases, gear, and differential boxes are fixed in order that they may be bored with absolute truth. It would require much more space than is at our disposal to detail the numerous up-todate tools and careful methods employed to ensure the reliability of the Napier cars, but the best course an intending purchaser can adopt, in order to assure himself that when his car is delivered to him he will drive an automobile into which all that is best in work and material has been embodied, is to pay a visit to the works. It is to enable clients so to content themselves that the site of the works has been fixed in so accessible a place as Acton, where the trams of the United Tramway Co. pass the gates

every few minutes, and a motor car will deliver a man in about twenty minutes from the City.

The extensive and well-appointed foundry stands at the rear of the site, and well apart from the rest of the works, and will, when completely equipped, possess some half-dozen furnaces, for the reduction of iron, brass, and aluminium. The shop is equipped with an overhead traveller, by which boxes and pots can be moved to any part of the floor.

The present and future machinery in the works is and will be actuated by two British Westinghouse gas-engines—one of 80 h.p. and the other of 60 h.p. Both these engines bear a notable resemblance to an automobile motor, the exhaust valves being operated vertically by lifting-rods, and the induction

valves by tappets.

For the man who desires to realise a first-class automobile in the building, and to acquire a notion why one is not made and sold at a profit for £100, as some wiseacres seem to opine they should be, we can recommend nothing more enlightening than an hour in a good motor car factory.

MOTORING IN AMERICA.

The photo-engravings given herewith are reproduced from photographs selected from a most interesting series sent us by our New York correspondent, Mr. Hugh Dolnar. In order to demonstrate the reliability of the Packard cars. Messrs. E. T. Fetch and M. C. Krarup made the overland trip from San Francisco to New York last summer. The first illustration depicts a road over the Sierras Mountains, between the states of California and Nevada. The left-hand illustration shows a wayside station in the sage-bush

covered deserts of Utah. The post seen in the background, which one of the intrepid travellers is examining, is the wayside station, and it is a point upon which travellers concentrate in order to take Some considerable train length of the route traversed by the tourists consisted of the old stage coach road over which Hank Monk drove Horace Greeley in his When the famous ride.

Sugar Loaf Mountain was crossed, at an altitude of 7,300 feet, the engine still continued to run in a normal manner, despite the rarefaction of the atmosphere. The way in which it did so was a mystery to the drivers. In anticipation of trouble at high altitudes, a piece of steel packing was taken on board to insert between the connecting rod and the big end bearing in order to increase compression, so as to enable the car to surmount many of the extraordinarily stiff gradients en route. It was

possible that the increased volatility of the petrol under the lower air pressure, combined with a larger admission of air, kept the mixture at its proper proportions. The journey was safely accomplished, but limitations of space prevent us giving a detailed account of the autocarists' adventures, though we hope to be able to reproduce one or two more of the photographs which we have.

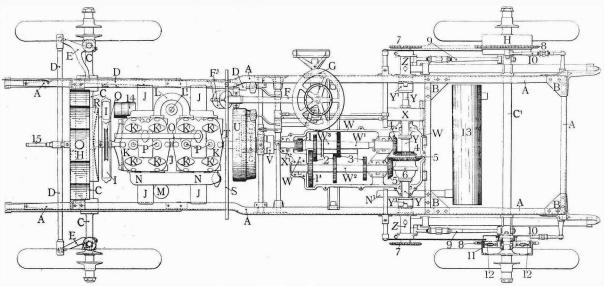




THE 22 H.P. CROSSLEY CAR.

A DESCRIPTION OF A NEW FOUR-CYLINDER CAR. AMONG ITS MAIN FEATURES ARE AN AUTOMATIC CARBURETTER WITH MERCURIAL DASHPOT, HOT JACKETED LUBRICATOR, EXPANDING CLUTCH, DIRECT DRIVE ON HIGH SPEED, PRESSED STEEL FRAME, H SECTION AXLES, AND SELF-ADJUSTING STEERING.

In the engineering world the name of Crossley Bros., of Openshaw, Manchester, is so well known that no further reference to it is needed. It conveys its own meaning, but for those automobilists who have only taken an interest in mechanical matters since they became owners of cars it may be necessary to add that Crossley Bros. have been for many years the most important firm of gas-engine makers in Great Britain, and in many respects they are the leading firm in the world. Their history is that of the internal combustion engine, and although, of course, their engines are for stationary work and for power purposes, beyond the mere fact of the weight being much greater per horse-power, and the speed much slower than that of a motor car engine, they are, to all intents and purposes, mammoth examples of motor car engines. It will, therefore, be of no little interest to say that, after long consideration, Crossley Bros. have decided to manufacture motor cars. They associated themselves with Messrs. Jarrott and Letts, who, by the way, will sell the Crossley cars, all the output of the Manchester factory passing through their hands as the sole selling agents. The Crossley car is designed by Mr. J. S. Critchley, who has been connected with the autocar industry from its birth, and it is the result of his experience as a motor engineer, combined with observations of Continental practice, and he has endeavoured to embody all that is best in the modern motor car in the vehicle which he has designed for Crossley Bros.; in fact, the combination is a somewhat unique one. There is the great firm of engineers, the competent motor designer, the racing man and tourist of exceptional experience, and the energetic man of business. With such a combination of manufacturing facilities, designing, driving, and business experience, it will be remarkable if very conspicuous success is not attained. Last week we had the opportunity of inspecting the complete chassis of the new 22 h.p. car, and also of going over the Crossley works in which it is made. That is to say, we not only inspected the process of manufacture of the motor car engine and the car mechanism generally, but also enjoyed, under the guidance of the works director. Mr. Turner, a short



Plan of the Crossley car, showing details of the change-speed gear.

A. stamped steel frame B B, frame angle plates C C, steering axle B B, frame who had been connecting axle C, rear axle D D, steering connecting rods E E, steering standard F3, steering standard F3, steering wheel H, radiator tank I, gear pump and magneto driving gear case
J J, aluminium crank chamber and carrying brackets K, double cylinder heads K^L (repeated), dogs holding valve chambers L, induction pipe L¹, expansion chamber M. carburetter

N. exhaust chamber s, exhaust pipe s, delivery pipe from cylinder water jackets P, sparking plug apertures Q, fan pulley R, rotary fan and case S, dashboard , crankshaft , flywheel and clutch flange , universal driving connection , aluminium gear box W^a, primary gearshaft W^a, secondary gearshaft W^a, sliding gear sleeve X, band brake drum

ring lubricating oil jets. Y Y, countershaft Y Y Y, countershaft driving dogs

Z. z. sprocket shaft bearing box
1, driving and driven first speed gear wheels
2, driving and driven second speed gear wheels
3, driving and driven third speed gear wheels
4, driving and driven fourth speed bevel wheels direct drive from motor 5 5, bevel wheels for one, two, and three speeds to countershaft 6, differential gear box 7.7, driving chain wheels 8.8, driven chain wheels 9 9, radius rods 10 10, brake radius rods 11, internal expanding brake drum 12 12, expanding brake segments 13, silencer 14. magneto machine 15, starting handle

tour of the whole of the Crossley factory. During the tour of inspection we were enabled to observe the scrupulously exact system of manufacture which will be followed in the turn-out of the Crossley car, and which, if our experience of engineering work goes for anything, will assuredly have the effect of gaining for the Crossley automobile as great and as world-wide a reputation as is to-day enjoyed by the Crossley gas and oil engines, which even the superlative folk of the States find they cannot better.

Our attention during our peregrinations of this hive of ordered industry was drawn again and again to the special methods adopted in turning out the several parts of the Crossley car, and those devoted to the absolutely accurate production and preparation of the cylinders and crankshafts and piston rings were especially noticeable.

Mr. Turner was courteous enough to arrange for the pouring of a twenty tons flywheel mould in our presence, and the running of one of four 700 h.p. two-cylinder gas engines which Messrs. Crossley and Sons are building, and have built, to drive mill machinery in the United

States of America. It is significant to add that a large and growing total of horse-power in gas engines goes from the works to the States, not-withstanding the exceedingly high tariff wall.

To leave the factory and return to the car itself, the diagram plan and the photographic elevation will, by consultation with the reference table appended, enable the reader to thoroughly comprehend the arrangement and disposition of the car. The frame, marked AA, is thoroughly well designed and proportioned, of stamped steel cambered in the web, where necessary, and stiffened transversely by three angle steels—one beneath the cellular radiator H, one carrying the rear end of the gear box W, and the third closing up the back portion of frame. The dumb irons taking the rear

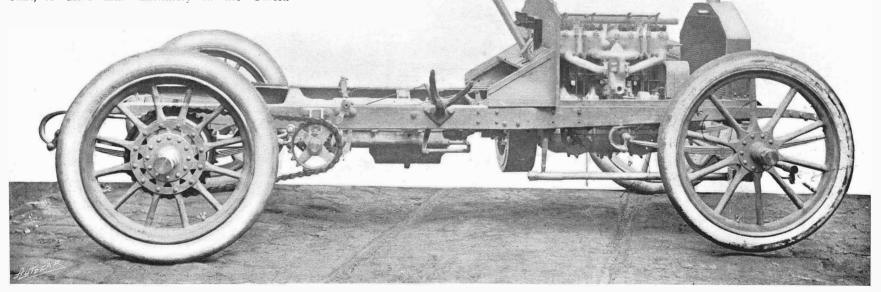
bolted to the web plates. The front net is closed in by radiating tank of springs are of the frame of the bona cellular ample di-

mensions, the draught through the tubes of which is induced by a rotary fan running at the engine speed, and belt driven off the crankshaft.

An underframe is dispensed with, both the crank chamber J J and the gear box W W being carried by their own aluminium brackets on the longitudinal and transverse members of the frame respectively.

The cylinders, which are cast in pairs, with their water-jackets and valve chambers, are bolted to the crank chamber, and are formed with the amplest water-jacketing both between each pair of cylinders and above and around the valve chambers. The valve flanges K K are made with ground joints, no washers being required, and stip over squared studs, so that there is no possibility of the stud twisting when nut is screwed home.

The jacketing is continued right down the cylinder, so that the piston rings never come in contact with an overheated cylinder wall, this adding greatly to their life, while the complete water-jacket of each

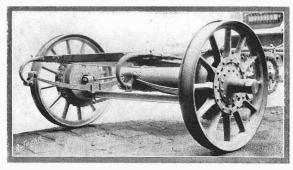


The Crossley 22 hp. chassis.

cylinder prevents any unequal expansion which is always apt to be set up when the cylinders are cast in pairs without a complete jacket, as the water never gets between the cylinders at the part where they touch, and consequently this is hotter than the cooled portion of the cylinder. The cylinders are

41/4 in. bore by 51/8 in. stroke.

A half-time shaft is set on each side of the engine. that on the right actuating the induction valves and the make-and-break tappets of the magneto ignition, and that on the left the exhaust valves. Provision is made for the insertion of high-tension sparking plugs in the crown of the combustion chambers, at P.P., if high-tension ignition is preferred or desired in combination with the magneto, but these ignition plugs can be inserted at will just above the induction valves in the orifices provided. The commutator for the high-tension ignition is driven off a short perpendicular shaft by bevel gearing from the rearward end of the right-hand half-time shaft. The makeand-break tappets for the magneto ignition are actuated by side cams on the same half-time shaft, and have a very simple movement and adjustment. O O is a return pipe, taking the heated water from



The Crossley rear axle, brake droms, and chain wheels.

the highest points of the water-jackets, and delivering it to the top of the cellular radiator H. The deliveries from the pump to the cylinder jackets are not shown.

The connecting rods and pistons are carefully balanced, and each rod and piston is made of exactly the same weight as the rest. The bearings of the crankshaft are not shown, even in dotted lines, but these are of exceptional length, and have their brasses all scraped in both to bed and shaft. The piston rings are of special manufacture, and

are made to be perfectly circular when in position in the cylinder by unique calibrating machines, which we were shown at work during our visit. Without going into a long description, it will suffice to say that this machine gives the necessary spring or set to the ring by means of a hammer which starts to lightly tap the inside of the ring at the cut. As the jig holding the ring revolves the hammer strokes become harder and harder till the fortissimo blow is reached exactly opposite to the cut in the ring. From this point the force of the strokes gradually diminishes in exactly the same ratio as it increased. The result is that the ring is of exceptional equality, as the spring in it is scientifically produced and unequal internal strains in the metal itself are obviated. Among the points where the Crossley experience is seen is in the metal used for the exhaust valves. This is of a particular bronze, which is claimed to absolutely prevent carbonising. This also reminds us that the exhaust valves are pocketed, so that there is no side strain put upon the stems from the blast of the exhaust.

The mercury carburetter M is on the left-hand of the motor, and is an automatic device of particularly clever design, the details and precise action of which we shall illustrate and describe in a future issue. The effect of this carburetter is to afford a perfect volume feed of mixture to the engine, no matter at what speed the latter be running, without the necessity of hand control. A piston throttle valve is also fitted, this being attached and controlled by the governor. The action of the governor, however, can be cut out from the steering wheel by a rotating lever set on a ratchet sector. Another sector similarly positioned advances or retards either ignition. The induction pipes are all of exactly the

same length from carburetter to valves.

On the right of the engine, and seen within the semi-circular bend of the induction pipe L, is fitted an expansion chamber, in which a conical rotating valve, governor, hand or foot-controlled, cuts off the mixture supply at any desired portion of the piston stroke. This apparatus, which was shown us on a chassis last week, has long been in use on Messrs. Crossley's well-known gas-engines, and has been found to operate most satisfactorily upon the trial car, but it is a question whether the arrangement will be fitted to the Crossley cars to be put upon the market, as the sensitive carburetter is claimed to do all that is necessary. The expansion chamber when fitted produces the same effect as lift-controlled induction valves, without rendering any interference with the actual valve lift necessary. We should imagine that in actual work it would make very largely for economical consumption at high speeds with light loads.

The flywheel U is cast with a heavy rim and light web, and also with a rearward projecting clutch flange to accommodate the metal-to-metal expanding segment clutch, shown by dotted lines within it. This clutch is novel in design, and has on trial fully satisfied Mr. Critchley's requirements. We shall illustrate and describe this fitting in a subsequent issue by photographic and diagrammatic illustrations. The drive passes from the clutchshaft to the primary gearshaft W1 and sliding sleeve W2 through the universal driving joint V, which prevents twist from frame deflection on the gearshaft and

bearings.

To describe the change-speed gear, we may say that this is on the lines of the latest Mors gear, and affords four speeds forward and a reverse. As shown in the plan, the gear is in the fourth speed, the drive passing from the clutchshaft by a positive clutch within the driving pinion marked 1, through the primary gearshaft W1 to the bevel gear 44, by which the countershaft is rotated. When the gears 13, 22, or 33 are in mesh, the drive passes through the bevel wheels 55 to the countershaft Y, the chain wheels 77, and the chains to the sprockets 88. Ball thrust bearings are placed at the forward end of the primary gearshaft, and also on clutchshaft and ball running bearings where necessary.

With regard to lubrication, this is all performed to the crank and gearshaft bearings from an exhaust pressure sight-feed lubricator upon the dashboard, the drips of which are hot-water jacketed at will to preserve the fluidity of the oil at low temperatures.

This lubricator has nine sight-feeds, three serving the engine and six the gear box bearings. The lubricator itself is kept fed by pressure with oil from an oil tank beneath the floor. The glass sight tubes are of much greater length than usual, and, having a white background, the feed of the oil is most readily observed from the driver's seat. The oil is fed to the oil wells beneath the bearings (see X1 on gear box), and is served to the shafts by ring feeders. Oil catches are formed in both chambers at the outer ends of the shafts to prevent dripping, the oil returning to the crank and gear boxes through leads provided for this. The half-time shafts are lubricated by dash from the connecting rod ends, catch leads being cast on the inner walls of the crank chamber for this purpose. The chain wheel ball bearings within the bearing cases ZZ are served by the wick feed lubricators shown. The main bearings of the crankshaft are 41/2 in. in length. Particular attention has been paid to that most vital matter the steering, the steering rods being of particularly large diameter, and fitted with Thackray spring washers at the ball joints, which make them self-adjusting, and do away with all backlash.

The silencer is of special construction, which we

shall refer to in a subsequent issue.

A point which serves to illustrate the practical knowledge and thought which have gone to the design and construction of this car is the fact that helmet oil lubricators are fitted to all the bearings on gear, brake, and radius rods and springs, so that oil can really be introduced to these parts, which is

far from being the case with the majority of automobiles.

The car is most efficiently fitted with brakes, there being a very powerful pedal-actuated, water-cooled hand brake on the countershaft and two internally-expanding compensated segment brakes within the drums HH carrying the sprockets 8.8. These internally-expanding metal-to-metal brakes are of identical construction with the driving clutch within the flywheel U. The coupling nuts on the radius rolls 9.9 are made in non-rusting metal, so that when it is required to adjust the rods the coupling nuts and rods will not be found to have rusted solidly together.

Each brake and sprocket drum HH is holted right through the spokes of the driving wheels to heavy circular washer rings, which relieve the wooden hoss of the spoke from the frictional pressure of the

retaining nuts and washers.

The steering wheels are 920 mm, in diameter, shod with 90 mm, tyres, and the driving wheels, of the same size, have 120 mm, tyres. The wheelbase is 8ft. 3in., wheel gauge 4ft. 9 ½in., and the weight of

the whole chassis 17 cwts. 1 qr. 14 lbs.

The front and rear springs are 42in, in length, the latter being, as shown, set outside the frame, so that the frame at moments of great road shock can dip down between them. From end to end the chassis exhibits the greatest care and thought in design and construction, the accessibility of every part to which access is desirable being of the readiest and simplest description.

AN AUTUMNAL EXPERIENCE.

I have been in many a predicament, and, excepting an actual overturn, have, at one time or another during the past six years, experienced almost every conceivable incident which might befall the lot of an automobilist. A fresh experience, however, turned up one autumn Sunday evening, and, to prove the stamina of a normally cared-for motor carriage, is perhaps worth recording.

I left Canvey Island at 8.30 p.m., with a lady and two gentlemen as passengers, about one hour before the time when the tide would make Benfleet Creek impassable, and though I knew that owing to the heavy rains the "road" across the fields which I had to traverse would be in a very bad state. I never saw anything, not even a ploughing engine, in such a condition as my car was in after a few hundred yards had been negotiated. The total distance to the ford is about a mile, and the cart track, with its enormous ruts and its abrupt embanked edges shelving down to a dyke on one side and to a ploughed field on the other, was more like the bottom of a claypit in February than a road.

The first trouble came in attempting to climb up on to the road out of a grass field, and this was successfully accomplished after slithering down sideways once or twice and getting firmly embedded in a rut, out of which we had great difficulty in extracting the car. Having, however, got upon the road, the difficulty was to keep there. I verily believe that out of the half-mile of "road" I did not traverse a yard in the ordinary way. On occasion I would travel for fully twenty yards at an angle of

forty-five degrees to the line of advance, and then would suddenly swing over and point in a similar manner to the other side. Once I turned at right angles and performed some extraordinary gyrations on the side of the slippery embankment, which shelved down to the dyke some ten feet below. As a result of these evolutions -or, rather, revolutions I finally came to a standstill, and the only movement obtainable was an effort to swing round as on a pivot. On inspection, the car presented such a sight as I shall not easily forget. The whole of the space between the wheel and the side of the body was a solid mass of clay, worked in so firmly that considerable pressure was required to make an impression on it with the fingers. It was cut off clean where the spokes of the revolving wheel had trimmed it up, and protruded in huge masses between the mudguard and body just like clay issuing from a brick-making machine, and obscuring everything, such as chainguard, the whole of the chain, sprocket wheel, and undergear in that immediate neighbourhood.

The night was as black as ink, and I had but two miserable benzoline lamps, which only cast weird shadows on the road without illuminating anything distinctly. Behold us, therefore, first scouring the black quagmire around, and afterwards, armed with portions of a friendly post and rail-fence, struggling with this solid compressed mass which was impeding our progress, and in front of us the tide racing in furiously, and every minute making the ford more difficult to negotiate. We succeeded,

however, in time in making a rough clearance, and, my passengers electing to cross by the ferry. I drove cautiously down into the stream, knowing that the bottom was hard, and intending to back out if it should prove unpleasantly deep. When about half-way it was fortunate, though most uncanny, to meet the ferryman punting across, and I felt in the darkness as though I was upon an illimitable sea of black swirling water, though in reality it could not have been more than one hundred yards across. The ferryman measured the depth and found it to be eighteen inches, and, having corrected my bearings. I landed safely again upon dry land, very much to my relief, as, owing to the impenetrable darkness

and the lack of a good head lamp, I could only see a few yards ahead, and I had already begun to conjure up visions of the car remaining in the stream, under twelve feet of water at the flood, until the tide should recede again and allow of its being taken out.

The car is a semi-modernised $6\frac{1}{2}$ h.p. Daimler, and has done yeoman service in daily routine work over rough London roads. These old "war horses," though not elegantly simple as are the cars of to-day, were solidly and honestly built to stand rough wear, and for all-round use are to be compared with the stiff thick-set cob so much prized for similar purposes in horse traction.

H. S.

A LIGHT HIGH-SPEED ENGINE.

There are but few tirms in the United Kingdom which devote themselves entirely to the manufacture of petrol motors, and one of these is the Forman

Engine Co., of Day's Lane, Coventry, firm, recognising the fact that there is a demand for a light four-cylinder engine of moderate power for small cars, set out to design such an engine as could be incorporated in any projected design of, or any existing, vehicle. We had an opportunity of seeing one of the first of these engines on the test stand a few days ago, and were much impressed by its steady running, despite the fact that some adjustment was needed at the governor. The accompanying illustration serves to give some idea of the neatness of this little engine. Each of the four cylinders is independent of the others—a feature

which has much to commend it in case of accident to any one cylinder. The cylinder body is provided with radiating flanges giving a large cooling area, while the heads are water-cooled. The dimensions of the cylinders are 80 mm. bore × 80 mm. stroke, and, running at a speed of 2,000 revolutions per

The Forman light four-cylinder engine.

minute, the engine develops 12 b.h.p. The outside flywheel is 12in, in diameter. The governor, which controls a throttle valve of the pierced disc type

placed midway between the inlet valves, is contained in a chamber forming an extension of the crank chamber, while the large diameter commutator is placed on the end of the camshaft, which also carries the governor weights. Bronze boxes cover the exhaust valvelifting cams, these boxes being distinctly discernible in the illustration, Their removal discloses the cam and valve plunger rod readily to view. The water-cooled heads are supplied with fluid through a branch pipe, in the centre of which the delivery pipe is placed, so that each water-jacket gets sufficient water for cooling purposes. Using a sufficiently rapid circulation

and a radiator of sufficient proportions, the cooling should be very effectual. To those who contemplate fitting a more powerful engine, such as this, to their cars, the weight and dimensions will be of interest. The overall length is 2ft. 3in.; width, 12½in.; height, 2ft.; and weight, 230 lbs.

An interesting article appears in the February number of the Badminton Magazine from the pen of Mr. Claude Johnson, the ex-secretary of the Automobile Club. It is entitled "The Magnificent Mercedes, the Rich Man's Motor Car," and comes as a foil to the previous articles by Major Matson on the little Benz, and how to run it for a wonderfully low expenditure. The article is an enthusiastic one, and describes the delights of soaring up hill at high speeds on a car with sufficient reserve of power to accomplish it. Some interesting figures as to costs are given, and as a proof that these high

powered cars are rich men's luxuries, it is only necessary to say that the outlay on tyres alone is estimated at about $8\frac{1}{2}$ d, a mile, or 5,000 miles for £195, and it is calculated on a mileage of 15,000 miles per annum that the total cost of running, including £200 for a mechanician to look after the car, would be £675. An error is made in giving Herr Maybach the credit for mechanically operated inlet valves. They are much older, though to him belongs the distinction of introducing them on a really fast and first-grade vehicle. In fact, he made a success of what others had discarded.

CORRESPONDENCE.

No letters from members of the motor industry will be published when they deal with subjects which may be regarded as advertisements for the writers' or their business interests. At the same time as many of the most practical suggestions come from those engaged in the motor industry their letters will be inserted when possible, though the names of the firms they represent may be expunged, and the initials of the writers substituted.

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Letters of a personal nature will be withheld.

The Editor, although accepting no responsibility for the opinions expressed by correspondents, reserves the right to publish a portion of a letter, and to omit any part which he does not consider interesting or essential.

essential.

All communications under a non de plume should be accompanied by the name and address of the writer, not necessarily for publication, but to assure the Editor as to good faith.

Enquirers who ask for the experiences of private owners with specified cars, parts, or accessories, are requested to enclose a stamped addressed envelope, so that replies which space will not permit us to publish may be forwarded to them. Circulars or letters from interested parties will not be forwarded.

Circulars or letters from interested parties will not be forwarded.

The figure to use their motion as a means of seeing the meet, but if they wish of seeing the meet, but if they wish the published to die as quickly as possible to die as quickly as possible

than good. When people come from long distances by motor to hunt, their auti-motor friends do not often greatly object, or if they do they feel there is not very much ground for complaint if the cars are considerately driven. On the other hand, those who drive to the meet in cars morely to look on and not to hunt are regarded as more or less of nuisances. They have a perfect right to use their motors as a means of seeing the most, but if they wish

PETROL VAPOUR LAMPS.

[3477.] As these are no doubt of interest to your readers. I would ask your permission to give my experience with a different system than the one mentioned by your correof air is mixed with one and a half per cent, of air is mixed with one and a half per cent, of petrol vapour, and produces a very brilliant light. I have litted up two installations for the inventors, and find them to be every bit as good as they claim. There is no risk of explosion, as the gas cannot even be lighted except through their patent burner; no smell, no pressure required, and no attendant to look after it. There is no bulky plant, as the installation for one hundred fifty candle power lamps only occupies 6ft, by 3ft, of space, and automatically makes exactly what is consumed from one light to one hundred with any variation between.

As regards the application for motor car lights, I do not agree with your correspondent that it is not suitable for motor cars. I am at present experimenting in this direction, and from what I now know of it am positive that it will result in a simple and very height light at very little cost. I estimate the cost of lighting two side lights, one large head light, and the rear lump at about 2d, the lot for about six hours as an outside figure.

For lighting stations, country homes, etc., there can be

nothing simpler. Draveott.

C. H. GWEST, M.I.M.E.

MOTORS AT MEETS OF HOUNDS.

[5478.] As you open your columns to correspondence on all matters connected with motor cars, I trust that you will find space for a protest against motorists who bring their motors to meets of hounds.

There are two sides to every question, and motorists may claim as much right to the use of country roads as horsemen, but I maintain that motors are entirely out of place at meets. I am sure the vast majority of hunting men are of this opinion, and they have good reason to

The master of a pack of hounds, having advertised a meet at a certain place on a certain day at a stated time, perhaps 200 or 300 horses and their raders will then be converging towards that place. A motor coming to the meet will overtake probably some forty or fifty horses, and thereby cause discomfort and amoyance to a number of the widers. But this is not all. That motorist for his of the riders. But this is not all. That motorist, for his own pleasure and convenience, causes danger to some of the riders and to their mounts. It is true these riders may run some danger later when riding to hounds, but this is for their own amusement, which is another thing,

Restrictions on motorists have been relaxed by the new Act, and in return I do not think it is too much to ask them to abstain from causing undue annoyance to people

engaged in other sports.

Young horses soon become accustomed to motors, whereas many old horses can never be made to overcome their aversion to them, and so for a few years drivers of cars will, I hope, be lenient to our four footed friends. who, after all, enable so many to enjoy the best of all sports.

P.S.-I own a motor car, and am a keen motorist, but would not dream of driving mine to a meet of hounds.

[We think our correspondent is right, and that in nine cases out of ten a motor at a meet of hounds, instead of overcoming prejudice, as some think, does more harm

CRITICISMS OF FRENCH CARS.

[3479.] I was sorry to see your criticism of Mr. Worby Beanmont's remarks on the French Show. I still more regret such a letter as 3,462 in last week's Autocar, the writer of which displays more vulgarity than did the

original.

I must say immediately that I thought Mr. Beaumont's article a very fair and amusing piece of criticism, the only possible objection to it being the use of some words not usually found outside the medical press, slang dictionary, or engineering shop. We are cold that the French manufacturers were offended by it. I am very little inclined to believe that, as I have never yet found a man who was keen on his work becoming offended by criticism. Such remarks as that Mr. Beaumout has no right to criticise unless he can design a better car are totally absurd. Under equal reasoning no critiques would be published of art, music, or the drama. For, I take it, it is an almost unheard of exception that a critic can paint, play, or write a piece better than the man he criticises.

No, sir, the real objection felt to the article is that Mr. Beaumont treats the designers of these cars as children in the engineering sense, i.e., he does not believe that they have had much engineering experience. This, no doubt, hurts their vanity, but it is in the large majority of cases quite justified. Most (or a great many) manufacturers have ascended to the automobile from the bicycle, and not descended to it from larger engineering works where a far greater amount of education and brains is required.

I am not personally acquainted with Mr. Beaumont. but, nevertheless, have heard of him as a consulting engineer. To try to discredit his abilities in the way "Justice" does is manifestly merely spiletul.

I enclose my card and remain,

TWO SIDES TO A QUESTION.

[3480.]—I have read with interest the letters which have appeared in The Autorar on this subject, and also the article by Mr. Worby Beaumont, which seems to have given so much offence. I, for one, demor to much of what your correspondents say. I do not know Mr. Beaumont, except as the author of one of the standard, if not the best text books ever written in the English language on the motor car. I certainly do not see anything "vulgar" in his article, and, having been at the Paris show myself, can endorse a good deal of what he said, and though it undoubtedly is unpalatable to the manufacturers, still criticisms of such a nature are most instructive to the public who use their productions.

I would like to point out to your correspondents that it does not require to be the owner of various makes of case for a practical engineer like Mr. Beaumont to see mechanical defects in construction, which make themselves at once apparent to a well-trained eye. I fully admit that at once apparent to a well-trained eye. I they admit that all round the French motor cars are superior in workmanship and finish to most English built models, and are only equalled by our principal builders, but even in some of the best types there are many mechanical refinements which, from a close inspection, I found to be absent. To enumerate some of them. In some of the types I found square shafts for sliding gears in year cases, the power in this case being applied at an angle of 45° to the radius of the shaft instead of tangential as in the circular shaft with feathers to take the drive. I found gear pinious holted together without being pinned through nut and bult, and on pointing this out to the maker's representative, was told "it was not necessary." I found the nuts

maide gear cases holding shaft journals not properly pinned and having no spring washers underneath. I saw many brakes, fit only for a toy shop, with in operating brake rods, and the brake bands always in contact with and rubbing on the drums. I saw gear teeth not rounded at the edges for intermeshing with their corresponding pinions. I found one of the best known cars by one of the principal makers atterly rained in their 1904 type by complications. Their 1905 type, of which I own one, was, in my opinion when I ordered it, and fully borne out by on my opinion when I ordered it, and fully borne out by experience, one of the simplest and most accessible cars on the market. I found the new type with gear case pushed back underneath a tank, where it would be impossible to inspect it without taking off the body. Crank chamber inspection doors so jammed up with steering column and piping that it would be impossible to inspect the interior, and, possibly, to remove the covers at all. There are other points that I could enumerate, but I have only gone into such detail as to justify and support Mr. Beaumont in his criticism.

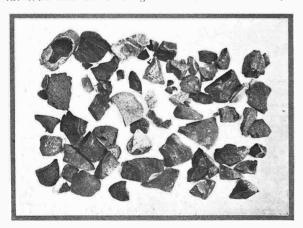
The bane of design now undoubtedly is complications put in it my opinion, by makers to go "one better than their rivals, and most of which are. I don't say useless, but not worth the extra expense and trouble given in the results. The golden words, "simplicity in erachinery, seem to be entirely forgotten by many makers.

MEM INST. C. ENGRS.

FLINTS ON THE ROADS.

[3481.] No doubt many motorists passing through London streets have lately had cause to complain at the shameful way the authorities of the various boroughs, especially Marylebone and Westminster, have been sanding, or I should say stoning, the roads during greasy or frosty weather. Instead of using a tine sand or crushed granite, as they have hitherto done, they have been using the greater affiling of this group, consisting of small flint. the coarse siftings of flint gravel, consisting of small flint pebbles, which, when thrown down on the hard wood paving and asphalt, splinter up into sharp razor-like pieces under the iron tyres of buses and heavy vehicles.

On returning from a half-hour's run, making calls round the West End and covering not more than two miles, I



A few of the sample flints, actual size.

abstracted not less than fifteen pieces of this flint from one set of tyres, which before leaving home were quite new. It is quite time steps were taken to stop this shameful practice. Not only do motor tyres suffer, but all users of the road having rubber tyres on their vehicles. I enclose a sample tuken at random from the barrow from which the many pressure salled a random that the words? which the men were so called "sanding the roads" in Great Portland Street, London, W., on Saturday, the 16th

of January.

Anyone throwing glass, nails, or any other refuse likely to cause damage to horses or vehicles is liable by law to

to cause damage to horses or vehicles is hadie by my to be prosecuted, and it appears to me that the borough authorities are causing equal offence in this act.

Trusting more of your readers will do all in their power to appose this, I for my share shall give in charge the next roadman I see throwing such material over the road.

E. J. COLES.

HYDRAULIC CARBURETTERS.

[3482.]—Mr. Fuller's letter as to the Napier regulator is, [3482.]—Mr. Fuller's letter as to the Napier regulator is, to say the least of it, unconvincing. The Napier pump is driven by that good old-fashioned method of friction off the flywheel (introduced eight years ago), and which always has and always will give trouble—an absolutely crude and unmechanical device. What happens then with the so-called positive regulation of air? Although some sort of a tin cover is put over the pump, it forms in no sense a protector. A little oil, mud, or water gets on to the flywheel, the numb, ships, and then where is the air the flywheel, the pump slips, and then where is the air regulation? Or the leather may become worn with the same result.

Again, the regulator cannot have that very fine adjustment necessary to obtain decent results if a leak in the water pipes or radiator does not affect it. Why use any water? It would be just as effective. The Krebs, on the other hand, is absolutely positive, as

it is controlled by the mere aspiration of the engine.

R. SETON.

[3483.] In reply to Mr. Fuller's remarks, I am fully [3485.]—In reply to Mr. Fuller's remarks, I am fully aware that the pump used on the Napier car is of a highly efficient type, both in design and economy of power absorbed, yet it is liable to be choked. Were the Napier to use the most perfect circulatory system ever designed it would still, however, be more liable to derangement than the atmosphere that surrounds us—the actuating used in the Napier. medium in the Krebs,

I cannot agree with Mr. Fuller when he states that leakage in the radiator does not affect the pressure in the cylinder jacket. NORMAN WELLS.

A PARAFFIN CARBURETTER.

[3484.]—It may interest you to hear that a Cremorne carburetter, which Messrs. Humber littled to my Humber-ette car a few weeks ago, has given very satisfactory reette car a tew weeks ago, has given very satisfactory results, working on common lamp paraffin. I had this carburetter fitted, as I am taking my car out to india, and though I believe petrol is obtainable in the larger towns, there are many "up-country cantouments where motor spirit would be very difficult or impossible to obtain. Paraffin lamp oil, on the other hand, can be obtained anywhere.

The advantage I derive, therefore, in being able to use motor spirit or recaffin in the same calluration is obvious.

motor spirit or paraffin in the same carburetter is obvious. tried the car during the week of very cold weather we recently had, and, notwithstanding the cold and the fact that I had a larger supply of water than usual (having had an extra water tank fixed under the back of the car to cool the engine when in use in India), the paraffin did

its work very satisfactorily.

To enable me to start up at once and warm the carburetter, a small tank for methylated spirit is fixed on the dashboard beside the main tank, and a pipe from this applicable into the proint first start to the replacement to the spirit sp small tank leads into the main feed pipe to the carburetter. I simply have to turn on the spirit, and in less than a minute the carburetter is sufficiently warm to allow the paraffin to be turned on.

I may mention that the carburetter is fitted upside down and connected to the inlet valve dome by a copper pipe four inches long. Perhaps this information may be of use to those of your readers who, like myself, wish to use a motor car in India, but who are uncertain as to the petrol

I have no interest whatsoever in the Cremorne carburetter or the Cremorne Company, but have written simply because I thought my success with this carburetter might be of interest to you, and, perhaps, of use to some of your readers G. CLARKE, Captain Indian Army.

AUTOMATIC CARBURETTERS.

[3485.] -- I have read with much interest in The Autorar of January 9th the article on "Automatic Carburation," by M. Henri Walcker, and also the description of the Cremorne carburetter in the same issue.

Now, to myself, these appear to be somewhat contradictory and opposite, for in the case of the former M. Walcker states as his chief point that the suction is constant and uniform, and he employs an air valve with a needle valve (for petrol) working as an integral part of it; and, consequently, if the one moves the other moves likewise, and thus keeps the air and petrol in the same relative proportions. Turning then to the Cremorne, we find they have a somewhat similar air valve actuated also by the suction of the engine as in the Walcker valve, but here they claim that the petrol is kept constant or nearly so, but that the admission of air only is varied pro rata

to the speed of the engine.

What appears to me is that as soon as an increased suction takes place, does not the additional lift of the air valve at once satisfy or compensate the extra suction, and thus produce and maintain a uniform and constant one? If so, why is this not the case in the Cremorne? Then assuming this to be so, how do we explain the conflicting differences in the two? In the case of one, the feed of petrol is varying pro rata with the air, but in the other it is kept constant. Here we have two entirely and opposite effects. I presume in the latter case that their statement is based upon the fact that the area of the petrol feed is so small compared with the area of the air valve that this varying suction exerts but little difference upon it.

The matter of automatic carburation is one of great importance at the moment, and I shall be pleased to hear some further explanation on the above points.

W. BLAMIRES.

CHAUFFEURS.

[3486.]—Let me write a word of warning to those about to embark on the purchase of a car, and a word of advice to those who have one and who either employ a professional chanffeur or who think of doing so. Some time ago, after driving cars for over two years, I thought I would be luxurious and go in for a professional chauffeur. Mistaken wretch! I soon found myself undeceived. I had taken wretch! I soon found myself undeceived. I had three, one after the other, and each was lazier and more of an idiot than the last. I gave him 30s, and food. On your advice, sir, I gave up these professional gentlemen as a bad job and took my groom in hand (a smart man, good at horses and stropping razors—if a servant can strop a razor well he is a good 'un), got him taught by a motor repairer four miles away for £2, and in less than three months he could have given my friends the "shuvvers" no end of points in driving and repairs.

No one from a duke to a doctor need have a "shuvver"

No one from a duke to a doctor need have a "shuvver." A servant who can strop a razor will learn your car in no time, and he probably won't be above cleaning the carriage work, which most "shuvvers" hate.

A BAS LES CHAUFFEURS.

THE MOTOR SHOWS.

[3487.]—Now that the time for the London motor shows is again approaching you might, through the medium of your paper, again call the attention of exhibitors to the matter of providing a sufficient number of capable attendants at their stands to answer enquiries and show the public the special features of their exhibits. Last there were signs of improvement in this respect, but still to get personal attention at all it was generally necessary to wait from ten to fifteen minutes till someone attached to the stand was disengaged, and then the chances were that the man or boy you got was no better than a clerk and quite incapable of properly explaining the good points of his exhibit. In fact, to get any information at all, except as regards records, one had to abstract it from the man supposed to know. Some stands at which there was in reality an ample force of attendants were no better than others where there was not, because in the former case they seemed to be under the impres-sion that to while away the time talking to some bosom friend or young lady, or among themselves, was sufficient service to the firm who paid their salaries, and there was no one there to remind them sufficiently often that it was not.

Another point is adequate means of identification. frock coat and silk hat, though perhaps somewhat conspicuous in the provinces, are not so in London. If attendants and principals while on duty wore a band round their arm with the name of their firm in gold letters thereon it would be a great help to visitors, as they would then have no hesitation in addressing them, knowing they were there to give any information sought.

Lastly, if firms would, instead of giving away elaborate and bulky lists, provide single leaflets, setting out very briefly the principal mechanical features of their exhibits, it would assist visitors to appreciate them fully and save time—a very important matter with most people. H.B

A USER'S EXPERIENCES.

[3488.]--I noticed in your columns a few weeks ago a letter from a reader asking for information of the Chenard and Walcker cars. Having owned one of the 14 h.p. vehicles since last June, no doubt my experience will be of interest to your correspondent. The reliability of these cars is no doubt due to simplicity and sound mechanical construction, and I put the low petrol consumption down to the unique form of governing and superior transmission. The inlet valves, while always being opened to the full extent of their litt, are by the variable width of the lifting surface held open for the inlet of the gas a longer or shorter time in proportion to the required speed of engine. The two distinct axles must considerably reduce friction caused by deflection, etc. I was induced to investigate this particular make by repeated laudatory reports in The Autocar. After some trial runs and thorough examination of the construction and workmanship, I considered that the machines were first-class value for the money. Of course, when comparing the mechanical points in these cars, it must be remembered that the identical pattern mentioned was on the English market over twelve months ago. Now, as everybody knows, the number of thoroughly sound mechanically constructed cars has considerably increased, but I think from what I have seen of the new 18 h.p. illustrated in last week's Autocar) it will turn out to be one of the best of the new cars for the year. It may be of interest to some of your readers who are looking out for a really reliable car to know that the only expense I have been put to during 3,500 miles has been the cost of two sparking plugs and the repair of the petrol supply pipe (1s. 6d.). The wallet supplied by the makers containing the usual spare parts is still intact, and even the original trembler blade is in use.

It may perhaps be necessary after the laudatory way I have written of these vehicles to state that, except as a private purchaser of one of these cars, I am unknown to

the makers and agents.

Unlike your correspondent "D.M.W. I belive many of your readers would often welcome a really unbiased account of reliable cars from disinterested private owners. L. P. MELL, M.I. Mech. E.

TYRES.

[3489.]--Mine is a heavy 22 h.p. car, and was originally shod with pneumatics on all wheels. Hearing so much about the way my type of tyres were bursting all over the country, I had those on the driving wheels changed to solids. The result was unexpected. Owing to the car solids. The result was unexpected. Owing to the car having too much of the weight on the steering wheels the bumping of the tonneau was so bad that at anything like twenty miles an hour it was uccessary to hold on tight. I made matters a little better by carrying two heavy pigs of ballast in the tonneau, but it was never comfortable. This was with pneumatics, but with solids the car travelled as smooth as possible, and no ballast was wanted. The only drawback I found was just at hirst with the transport of the control of while the tread was rounded. It was risky driving at anything like speed, as the car swung about so badly, due to the bad balance and the little grip the tyres had on the road. As soon as the tyres were flat this dangerous swinging ceased, and the car has gone comfortably ever since.

[3490.]—As so many of your correspondents seem to be interested in the question of solid v. pneumatic tyres, possibly my experience may be of some interest to them. My first car was a low-powered one with a top speed of twenty-twenty-two miles per hour, on which I had Falconet compound tyres fitted, as, like most beginners, I had an exaggerated idea of the trouble pneumatics gave. I drove this car about 7.500 miles before I sold it. Though it was very satisfactory and reliable on the road. I had many breakages of bolts, due to the tyres, and had to spend a considerable amount of time overhauling it after every long run for loose nuts, broken lubricating pipes, etc. I then bought a higher-powered car of the same make fitted with Michelin extra fort tyres, which I have driven for about 4,000 miles. I have never been stopped for a minute on the road by any tyre trouble or any engine trouble beyond a few minutes for a sticky valve. I have had no repairs of any kind to do to the car, nor any renewals beyond two new driving chains. I have had two covers retreaded, one after about 1,500 miles owing to

having cut the tread a good deal through having to stop suddenly for a sheep rushing in front of me, and the other after about 3,200 miles. I have never had a puncture or a burst. I have driven from the South of England to Scotland and back, and use my car all the year round. As the roads where I live are mended (?) with flints, which are never rolled, this is a severe test of tyres.

On a car fitted with solid tyres the cost of repairs to engine, axle bushes, steering gear, etc., in my opinion, is far greater than the cost of pneumatic tyres, and as to comfort, comparison is impossible except on perfect roads at a very low speed. Personally, I would not accept solid tyres as a gift.

B.L. tyres as a gift.

[3491.]—I should like to set the minds of your correspondents at ease on this question, as I have tried both pneumatics and solids, and there is no doubt whatever that the former affords considerably more comfort in driving.

I have noticed that one of your correspondents states that the pneumatic is unreliable and not worth a straw to business men. Allow me to advocate the process of the masgow Motor and Tyre Company, that by their process in conjunction with the Cassell unpuncturable band they guarantee pneumatics as reliable as solids.

I may say that after trying their process for over six months 1 have never known what a puncture or tyre trouble is.

[3492.] In reply to "F.S." I think I need only draw his attention to the results given by the various forms of tyres in the recent Automobile Club 1,000 miles reliability trials. The percentage of failures with pneumatics was enormous, and it was conclusively proved in those trials that no pneumatic tyre could be relied upon, and that at least one form of solid rubber tyre could be relied upon, even at speeds of over thirty-five miles an hour, at which rate a car fitted with solids won in Class C speed tests.

I was recently travelling up a long hill on one of my

solid-tyred cars, and we gradually overtook a similar car tyred with pneumatics, and I shall never forget the look of astonishment in the occupants' faces when my car gradually drew past theirs, and the driver exclaimed, "Oh, solid tyres!" Your readers have already been acquainted with the reason why some solid tyres have a more direct drive than pneumatics and, consequently, are better hill-

With regard to bicycles in the old days, I was not talk-With regard to incycles in the old days, I was not taking of specially made racing machines but of the general run run of roadsters, which weighed with solid tyres about 60 lbs., whereas they now weigh about 20 lbs. As an old rider of a bicycle who toured 1,000 miles a month in the summer, and who has ridden for the last twenty years in Great Britain, the Continent, and the Colonies, I think 1 may be allowed to know something in connection with bicycles, and to verify my statement it is only necessary to examine and weigh some of the old roadsters that are still to be found, or to consult some of the old manufac-turers. I repeat that it is the difference in weight of the solid and the weight of the pneumatic that prevents as large a solid as pneumatic being used on a cycle, but with a mechanically-propelled vehicle the extra weight makes no material difference.

PETROL CONSUMPTION.

[3493.]—I see in your advertisement columns a statement that the owner of a 12 h.p. Darracq, which he wishes to sell, can travel thirty miles on one gallon of petrol. I should be glad if any of your readers could give me their experience, as I find about twenty-two miles the maximum, and the average works out at about twenty.

SUMMARY OF OTHER CORRESPONDENCE.

Non-skids. The Parsons Non-skid Co. write in reply to the letter of M.R.C.S., in which he apparently refers to the behaviour of the Parsons non-skids on solid tyres, fearing that the impression may be established that the non-skid chains cannot be used in conjunction with solid tyres without trouble. They say:

"In the particular case referred to the solid tyres stood so little above the rim that upon had reads the compression

so little above the rim that upon bad roads the compression of the rubber with the heavy car allowed the rim to pinch and break the chains between itself and the road.

"Now, conditions like there are replans mores than run-

Now, conditions like these are perhaps worse than run-

ning the chain upon an iron tyre, and though we have supplied some hundreds of non-skids for solid tyres we have no record of a parallel case, but, on the other hand, have supplied them for heavy electric carriages, goods' delivery vans, steam 'buses with twin solid tyres, and only recently have had the honour of supplying a number of non-skids for the motor tractor and motor five engine of the Metropolitan Fire Brigade.

"It will therefore be seen that, provided there is sufficient rubber in a solid tyre to keep the edge of the rim well over the ground, every success will attend running our non-skids upon such tyres, whilst, of course, with a pneumatic tyre no question of this sort enters into the case.

"In the ordinary way a chain breakage in a new non-skid is a very rare thing indeed with the latest material, and if the non-skids are occasionally truned inside out the wear will take place on alternate sides of the chains, and the life will be doubled."

THE SALE OF CLUB PATRONAGE. We have received a number of letters concerning the action of the Automobile Club on the show question and the sale of its patronage. We are unable to publish these, as they throw no new light upon the subject. So far they are all unanimous in condemning the policy of the club, and although there must, of course, be those who disagree with the opinions which we expressed, we may say that we have received no communications taking the opposite view. The tone running through the correspondence is one of distress without they are said its name. running through the correspondence is one of distress rather than anger that the club should have sold its name, though many writers deal with the lamentable fact that the policy laid down by the club two years ago has been departed from prematurely, so that no further reliance can be placed upon its decisions. More than one writer suggests that the club should at once rescind its recent resolution about the show. A general expression of disapproval of trading by the club is also prominent, as it appears to be generally felt that this mercenary policy can only result in the reputation of the club suffering, both as an honourable society promoting trials with absolute as an honourable society promoting trials with absolute impartiality and as a social organisation. We should, perhaps, add that Mr. Cordingley returns thanks for the congratulations he has received during the last few days on the action of the club in again associating itself with his exhibition.



Photo by

Campbell & Gray.

THE CHATSWORTH CAR. While on a visit to Chatsworth H.M the King was entertained by the presentation of a pantomime in which Mr. Stewart manœuvred an extraordinary libel on an automobile, a photograph reproduction of which is given above.

Flashes.

It is stated that nine hundred motor cars and motor cycles have been registered, and eleven hundred motor car drivers licensed, in the county of Surrey.

The Simms-Bosch magneto ignition promises to be largely used in the Gordon-Bennett race, as the Clément, Georges-Richard, De Dietrich, and Hodgkiss cars will be fitted with it for the French eliminating trials, and it will be remembered that Jenatzy's victorious Mercedes was provided with this system when it won the Gordon-Bennett race last year.

At the recent Pembrokeshire Assizes, Mr. Justice Walton and a special jury heard an action in which Mr. C. W. R. Stokes, solicitor, of Tenby, sued Mr. T. D. S. Cunninghame, of Penally, for £122 128.4d.

-damages caused by plaintiff's horse taking fright at For the a motor car. defence it was contended both parties came to a corner almost simultaneously, and the car driver pulled up immediately, and that the accident was inevitable, or due to plaintiff driving an untrained horse. The jury, however, found for plaintiff, and awarded £102 damages.

It is said that Madame du Gast, the plucky lady who drove so well in the wild scurry from Paris to Bordeaux last year, will steer an 80 h.p. Benz-Parsifal car in the German Gordon-Bennett eliminating

Having regard to the terrible scenes witnessed by Madame du Gast in the first stage of the unfinished Paris-Madrid race, nerves of the strongest must be hers.

We are informed that the Century Engineering Co. have taken over the works- and, in fact, the entire business- of the Century Engineering and Motor Co., Ltd., at Cumberland Park, Willesden. Their new cars, with many others, will make their first public appearance at the Crystal Palace Show next month.

A number of the exhibitors at the late French Salon d'Automobile are agitating through the columns of our contemporary La Vie Automobile for an advance in the date of the exhibition. They desire that it should be held about the end of October. M. Cottereau writes our contemporary at considerable length urging the division of the profits accruing from the Salon as follows: One-fourth for the benefit of automobile workmen, one-fourth for propaganda, one-fourth to charity, and the remaining quarter to the exhibitors.

On Thursday evening the passenger motor car, registered in Glamorgan as "L 115," the property of the Aberdare Valley Motor Car Co., was leaving Aberdare for Aberaman, when, owing to the bursting of a petrol pipe, the car caught fire. The driver (A. H. Bolitho), however, showed great presence of mind, and the flames were quickly extinguished without any of the passengers being injured.

There is some prospect of the Kentish roads being less muddy and dusty than they have hitherto been, as the County Council have decided that no more quartzite should be used on account of the dust and mud created. Last year the Council purchased 1,580 tons, but its use has been condemned by the road expert employed by the County Council.

As far as those automobilists who are going over to Homburg for June 17th are concerned, their

licensing troubles are not yet consigned to oblivion, as the Gordon-Bennett Committee of the Deutscher Automobile Club, actuated by the express desire of the governing authorities, has decided that all automobiles, both German and otherwise, are to carry a plate, to be provided by the German Automobile Club at cost price. and bearing the symbols G.B. and a number. these means the German authorities hope to render the task of controlling the race much easier.

A Welsh correspondent, in calling attention to the disgraceful state of the road from Penarth to Savernock,

says: "The road, which is much used by autocarists, was at one time in fine condition, but now it is a A local cement company are actually laving rails across the road. The rails last week caused damage to my car, and I intend going on the warpath against the responsible authorities.

We understand that the Collier Tyre Co. will present a very good report to their shareholders at the general meeting which takes place shortly.

On the suggestion of the Mayor, the Tunbridge Wells Education Committee has decided to open a class for motor car construction and driving at the local technical institute.

We learn that the Hon. C. S. Rolls has been asked to stand for the Fulham constituency of the London County Council at the coming election. We have no doubt that if Mr. Rolls should agree to stand, he will be accorded the united support of all the automobilists and motor cyclists who have votes for Fulham.

"THE AUTOCAR" DIARY.

"THE AUTOCAR" DIARY.

Jan. 30. - Lincolnshire A.C. Paper, "The Cost, Care, and Upkeep of a Motor Car," by Dr. Gilpin.

30. - Midland A.C. Road Reminiscences.

Feb. L.—Entries close for International Cup for Motor Yachts.

1. - Scottish A.C. (W. Section). Paper, "Evolution of Road Making in Scotland," by Mr. R. Hammond.

2-G. - Liverpool Motor Car Show.

3. - Society of Arts. Lecture, "Steam Cars for Public Service," by Mr. T. Clarkson

3-6. - Paris Torin Tourist Run.

4. - A.C. G.B. and I. Paper, "Why Motor Cars?" By Cargill Gentry.

5. - Berkshire A.C. Inauguration Dinner.

6. - Midland A.C. Annual Dinner.

10. - Royal United Service Institution, Lecture, "Motor Traction in War," by Major N. H. Balfour,

11. - Clasgow University Eugmeering Society, Lecture, "Ree int. Developments in Internal Combustion Engines," by Mr. L. Rottenburg.

12. - A.C.G.B. and f. Non-stop Trials, Oxford Road.

12. to 24. - Crystal Palace Motor Car Show.

15. Conference: A.C.G.B. and I. and Provincial Clubs.

12. 32. - Hull Motor Car and Cycle Show.

19. - Entries close for A.C.G.B. and I. Side-slip Trials.

Mar. 19-26. - Motor Car Show, Agricultural Hall.

June 17. - Gordon-Bennett Cup Race.

The Star Engineering Co.'s factory continues to grow, and with the latest additions and increased manufacturing facilities the works are now capable of turning out cars at the rate of six a week.

Touring automobilists, especially those who have a fondness for what is known as the garden of England, will welcome the appearance of a new topographical work by Charles G. Harper, descriptive of that corner of the county of Kent which is associated with the life and work of the author of "The Ingoldsby Legends." Under the title of "The Ingoldsby Country" Mr. Harper has in a most fascinating manner dealt with the quaint vet revered associations which centre around Canterbury, the birthplace of that genial wit and humorist, the Rev. R. H. Barham, and this book, like the many others of a similar character that have proceeded from the same pen, is well worth perusal.

The Gordon-Bennett committee of the German

Automobile Club has decided upon an entrance fee of 3,000 marks (£150) to its eliminating tests, this amount giving any one competing firm the right of entering up to three cars. It is thought that the venue of these trials will be in the neighbourhood of Lüneburg.

In the King's Bench Division, on Wednesday last week, before Mr. Justice Grantham and a jury, Mr. Edmund Howe, a clerk of works in Government employment, recovered £200 damages from the Alidays and Onions Engineering Co., Ltd., he having sustained a fractured leg by being thrown out of one of their cars, in which he with a friend was being driven on a trial run round the grounds of the Crystal Palace during the show of November, 1902.

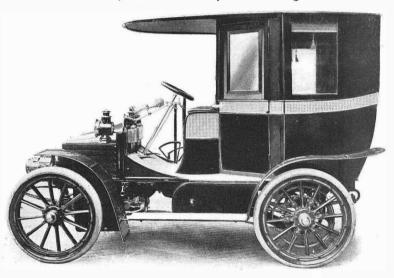
siderable interest among local farmers. It is thought that small local syndicates might be formed for the purchase of one of these machines, and with it two or three days' work might be done on each farm in succession.

It is always necessary to be careful when dealing with unknown repairers. Unfortunately, the assurance of the repairers themselves cannot always be taken as true. As an instance, there is a firm which claims to be one of the largest repairers in London and able to carry out any class of work. To show their qualifications, we need only mention that their manager rang up a firm of manufacturers to know whether they could supply him with the first and second speeds of a make of car which we will call A, or, if they had not these, would they send the same gears from another make, which may be called B. It was confidently asserted by the repair manager that the gears in the A and B cars were identical. As a matter of fact, there is as much similarity between them as there is between the gear of a 6 h.p. or 7 h.p. voiturette and that of a 35 h.p. car.

We shall be glad if our correspondent who signed himself "Welshman" will send us his address, as we have mislaid his letter.

Mr. H. Ducros, jun., and Mr. Charles Sangster on Wednesday drove an Ariel motor car to within a short distance of the summit of Snowdon. Seven feet of snow at the top was the only thing that prevented them reaching the summit.

The business and motor car patents of Messrs. Wilson, Pilcher, and Co., Ltd., have been acquired by Messrs. Armstrong, Whitworth, and Co., of Elswick Works, Newcastle-on-Tyne, who will in future manufacture the Wilson-Pilcher cars, under the supervision of Mr. Wilson. Following so closely upon the adoption of the motor car industry by Messrs. Crossley Bros., Ltd., of Openshaw, Manchester, Messrs. Armstrong, Whitworth, and Co.'s entry into the industry is interesting.



* * * AN IMPROVED HANSOM CAB BODY. This is the type of vehicle which The recent agricultural motor tests seems most nearly to reach the professional man's horse-drawn brougham. This in Warwickshire have created con- car provides luxurious accommodation for two people. The cab front is bevelled and the driver's seat is in the middle, with all the control brought up to the centre, so that both occupants have a clear view ahead. The car itself is of the ordinary Wolseley pattern.

> In the King's Bench Division of the High Court of Justice, on Thursday last week, Mr. Walter Longley Bourke, of Manchester, appealed against an award made by Professor Hele-Shaw, who as arbitrator had awarded the Lanchester Engine Co. £114 in connection with a claim for repairs to a motor car. It appears that the car after being in use a month was returned to the company for repairs, which were estimated by them at £64, of which £20 was for new tyres. As a result of the arbitration procedings the company was awarded £114, this award being based upon estimates of the cost of the repairs independently obtained from the company by the arbitrator. Mr. Justice Wills and Mr. Justice Kennedy decided in favour of Mr. Bourke, and ordered the award to be set aside. without, however, imputing any wrong conduct to the arbitrator. They further remarked that they considered the appellant had received good value for his money, the reference being to the amount of the original estimate.

SOME OUERIES AND REPLIES.

We are always pleased to reply to queries, even if they be of an elementary and untechnical description, under this heading. Only a selection of those which are of general interest will be published, though all will be answered direct through the post, for which purpose a stamped and addressed envelope should be enclosed.

When advice concerning different makes of cars is sought, each vehicle should be given an identifying number Letters should be addressed The Editor, "The Autocar," Coventry.

ACCUMULATOR CHARGING.

I have a compound dynamo, with which I can light six sixteen candle power thirty volt lamps (B efficiency). Each lamp passes a little over one ampère. Therefore two or more of them in parallel would be a convenient form of resistance for charging (1.) Will they sufficiently reduce the voltage if I am careful not to run the dynamo at more than, say, thirty-two volts? I have a large voltmeter reading up to sixty volts. (2.) When I connect this in series with my parallel lamps, just as I would connect the accomulators if I were charging them, why does it read thirty volts, the same as when I connect it across the terminals of the dynamo, as if the introduction of the lamps (in parallel with one another) into the circuit did not reduce the voltage at all? I understand about charging at about one-sixth or seventh of capacity. (3.) What is the maximum difference allowable between the voltage of the charging current and the opposing voltage of the cell or cells to be charged?—H.R.W.

Your dynamo, being compound wound, is not so suitable for charging as a shunt-wound machine. Great care must be taken to avoid any accident to the dynamo belt when charging. If this belt breaks or slips off, considerable damage may be done to the dynamo. The accumuable damage may be done to the dynamo. The accumulators must never be connected up when the dynamo is at rest, as the current would then pass the wrong way through the coils. With a shunt-wound dynamo these

special precautions are not so necessary.

Reckoning that four watts per candle power is the average consumption of power by incandescent lamps, we have: Ampères \times volts = 4×16 , or approximately, ampères = 2. This is probably somewhere near the mark, and in that case a thirty-ampère-hour cell should be charged either through one sixteen candle-power lamp or one sixteen and one eight in parallel. There is no need to take special pre-cantions to keep the voltage low when charging. In fact, it may be rather higher than when using the lamps for lighting. The only limit is that, if the voltage is allowed to rise too high, the lamps will not last long. Taking your

questions in order-

(1.) There is no question of reducing the voltage. If the proper lamps are in circuit the voltage will adjust itself naturally. Say you are running at thirty-five volts. The drop of voltage between the terminals of the lamp might be thirty, and the drop between the terminals of the accumulator five. Now suppose the opposing voltage of the accumulator to rise, so that, say, seven volts are required to force the necessary current through. Practically the only effect will be to reduce the voltage between the lamp terminals to twenty-eight, so that the lamp will burn rather dimly. The rate of charge will remain almost the same. If you make a small charging board like that recently described in "Hints and Tips," all you will have to do is to connect up as there explained after the dynamo has been run up to somewhere near its normal speed. Disconnect the accumulators before stopping the dynamo to prevent the cells from discharging themselves. We assume that when you say that your dynamo lights six sixteen candle-power lamps, you intend that the lamps should be in parallel.

(2.) If you have made no mistake in your connections the reading of your voltmeter appears curious, unless the resistance of the voltmeter is very high. The resistance of one of your sixteen candle-power lamps is probably about The resistance of two in parallel would then

fifteen ohms. 15 = 74 ohms. Suppose the resistance of the be about -

voltmeter to be 300 ohms, or about forty times that of the lamps. If the voltage at the terminals of the dynamo were thirty volts only one-fortieth of this or about three-quarter ohm would be the "drop" in the lamps. The

"drop" between the terminals of the voltmeter would still be twenty-nine and a quarter volts. between this and the voltage between the terminals of the dynamo is small, and may have escaped your notice. The voltmeter should always be connected in "shunt" or "parallel" with the accumulators, and never in series, as its resistance would seriously affect the current flowing. and the instrument itself might be injured. Probably a more useful way would be to connect it across the terminals of the dynamo, as the drop of voltage on the accumulator

will look after itself.

(3.) So long as you keep suitable lamp resistance in series with the accumulator there is no limit. If charging without lamps, accumulators should be connected up in series groups of five or six, giving an opposing voltage of about twenty to twenty-eight if the voltage of the dynamo is rather over thirty. This method would not be so simple, and you would need an ammeter.

RUSTING AT THE RIMS.

Would you kindly let me know through your valued paper The Autorar what is best to do to the rims of motor car wheels which have rusted through wet getting in at the edge of the tyres? Would it do to clean the rust off with sandpaper and paint with good oil paint, or other good preparation of a like nature !-J. TREVOR DICKSON.

Clean up the rusted parts of the rims quite bright with emery cloth, and then give such parts a coating of coach finisher's priming, or a mixture of lampblack ground in turpentine and best Japan gold size. After two coatings of this use coach finisher's paint of the desired colour, or ordinary paint, to which a little copal varnish has been

TO DELAHAYE OWNERS.

I drive a 12 h.p. Delahaye car. This car is controlled by spark and mixture lover on steering column with pedal throttle. The carburetter is of a very simple surface type. I find the car very economical in petrol. What I wish to ask is this—Is it more economical to run with my throttle open and weaken the mixture till the car runs at a moderate speed, or run with the throttle shut as far as possible and the mixture adjusted to give the greatest power—the sparking being advanced in each case according to the engine speed? advanced in each case according to the engine speed? In the first case I gain by getting proper compression, and in the second case I gain by using a mixture of correct proportions. In which way shall I get most economical running? I may say I am never troubled with water boiling. I have run a whole summer without adding more than a quart of water to the tank altography. altogether. Also I have not noticed any difference in regard to fooling of sparking plugs whichever way I can. A second point on which I should be grateful for information is in connection with mica-insulated sparking plugs. I have had in use for nearly two years two P.M. plugs. The plugs seem as good as new still. I found I had a lot of trouble when using Pratt's spirit (A or B) with the plugs sooting and then misfiring. I started all right, but after going a couple of miles the trouble began. I stopped and cleaned the plugs, and then had no more trouble till the next time when I started from cold, when the same trouble occurred. I tried Carless-Capel petrol and had no trouble at all. I tried Pratt's A again, and immediately the trouble began again all else being the same. I put in my spare plugs, which I had never had occasion to use before. They are ordinary plugs with porcelain insulation. Since putting them in I have been using Pratt's A (s.g. .700) without any treplace. trouble.-F.H.I.

THE LEGAL ASPECTS OF THE MOTOR CAR ACT.

By Earl Russell.

As so much confusion as to the exact provision of the Motor Car Act, 1903, and the regulations of the Local Government Board made thereunder appears to exist, I have endeavoured to present as concisely and as clearly and accurately as I could the main features of this legislation and the manner in which it will affect us all.

The first section penalising reckless driving meets, 1 think, with the approval of almost every member of this club, and is really the only portion of the Act which required enactment. The power to a police constable to apprehend without warrant is limited to the case of a person who has already driven recklessly, and who in addi-Lion has

(a) Refused to give his name and address or to produce his license, or

his license, or

(b) Is driving a car without an identification mark.
Section 13, requiring a male servant's license for a "person employed to drive a motor car." is reasonable, if reasonably construed; that is to say, where the engineer corresponds to a coachman. Where, however, he is an engineer, and only drives the car incidentally to or from the stable, it would be unjust to impose the tax, and I hope that any attempt to do so will be resisted by automobilists in general and by the Motor Union.

Registration.

To effect registration the owner must apply and give a few simple particulars, and pay a fee of 20s. The council cannot refuse a registration, but must assign a number forthwith. Any owner can apply to any council for his registra-tion, not necessarily the one in whose area he resides. The regulations do not prescribe the hyphen shown in alternative diagram No. 2, but only a space of 1½in, between the letters and the figures. The provision in the draft order that no other letter shall be placed or shall appear within 24in. of the plate has disappeared. The concession as to painting the mark upon the car instead of using plates may also be of use to some owners. Similar plates must be fixed upon any other vehicle drawn by the car, but at one end only,

The onus is thrown on the driver of seeing that his number remains easily distinguishable by day and properly illuminated at night. Strictly speaking, therefore he becomes liable to the heavy penalties of the Act if he does not wipe it clean every two or three miles on a muddy day.

Driving Licenses.

The third section of the new Act provides for the grant-The third section of the new Act provides for the granting of licenses. It is an offence under the Act either to (a) "drive a motor car on a public highway" without a license, or (b) to "employ any person who is not so licensed to drive a motor car." A person can only be licensed in the county or county borough where he resides; the fee is 5s. a year, and the grant of the license to persons of either sex is compulsory without examination, unless the applicant is disqualified. There are three disqualifications qualifications-

(a.) Being under seventeen years.

(b.) Holding a license already for another county.

(c.) Disqualification by order of the court, under Section 4.

The court before whom any person is convicted shall cause particulars of the conviction, and of any suspension or disqualification, to be endorsed upon the license, and shall send a copy to the council granting the license. compulsory endorsement applies to every offence in nection with the driving of a motor car, except a or second conviction for exceeding the speed limit. these are not to be endorsed, it is not quite clear how a driver will ever reach a second conviction except at the same court. The particulars of the endorsement are supposed to be carried on from year to year, though I can find no provision for this except a casual note on the form of license shown in the regulations. The driver of a car must always produce his license when required by a police constable.

Speed Limits.

The new Act provides a maximum speed limit of twenty miles per hour, with power to the Local Government

*Excerpts from a paper read before the A.C.G.B.I., Jan. 21st.;

Board to fix a speed limit of ten miles per hour, on the application of the local authority, with a view to the safety of the public in certain places. Prosecutions for exceeding the speed limit simply are subject to the following safeguards:

(a.) Warning shall be given at the time, or notice sent within such time as the court think reasonable, in no case exceeding twenty-one days.

(b.) The first and second offences shall not involve endorsement of the license.

(c.) There shall not be a conviction for exceeding twenty miles per hour "merely on the opinion of one witness as to the rate of speed." This last safeguard does not apply to exceeding the ten miles limit.

The Local Government Board may make regulations to prohibit or restrict the use of motor cars or any special kind of motor cars on any part of a highway which either

(a) Does not exceed 16st. in width, or (b) Is in the opinion of the Local Government Board especially dangerous.

Some Observations on the Act.

The Act has been so hastily thrown into its present that it is not surprising to find it till of anomalies, meon-sistencies, and inaccuracies. The framework of the Bill, as introduced by the Government, provided, broadly speak-ing, for registration of cars and their drivers, with the ing, for registration of cars and their diverse, with the accompaniment of number plates and licenses, and for the removal of the speed limit. The whole scheme was, however, altered by the introduction of a speed limit and numerous other harassing sections, and it reflects some credit on the draughtsmen of the Local Government Board that the Act, as finally passed, is not in an even worse shape.

Among the anomalies may be noticed the two kinds of local authorities, of which one registers and licenses, while the other recommends roads for the ten miles limit, and has the duty of erecting notice or caution boards. Another is the curious difference already noted between the evidence required to convict for exceeding the speed limit of twenty miles, but not required for the ten miles limit. The "Good Samaritan" clause was proposed by Lord Camperdown, and most rashly accepted by Lord Balfour of Burleigh, and gives rise to a host of conundrums, none of What is an accident? them admitting of an answer. When is it owing to the presence of a motor car on the road? Where is the motor car to stop, and how long? If a lady falls off her bicycle through sheer terror, is that an accident? If an unattended horse and cart runs away, an accident: If an unattended roles and care tuns away, is it in charge of any person? If three motor cars pass, and one horse runs away with its rider, which car is to stop? If a horse bolts for half a mile with a carriage and then turns it over, is the motor car to stop where it starts bolting, or where it finishes? These questions must not be regarded as frivolous, for they are absolutely germane to the actual words of this amazing section of this most amazing Act, and any one of them may be seriously argued before the Divisional Court on appeal from a conviction.

As the section now stands, if you only knock your person senseless or even fluster him sufficiently, so that he omits to ask your name and address, you can drive on with perfect safety after waiting a reasonable time.

The Act says that "a mark" is to be fixed to the car, and this can only mean one mark. All the mark is to do is to indicate "the registered number of the car and the council with which the car is registered." The Local Government Board has power to make regulations as to how this mark "shall be fixed on the car, or on a vehicle drawn by the car, or on both." Under a later section they have power to make regulations as to its "size, shape, and character," mode of fixing and illumination, and the keeping of the register. It is true that in this section (7) the words "identifying marks" are used, but they relate to "motor cars" immediately preceding, and also in the plural.

The Local Government Board endeavour to get over the difficulty by saying in Article 7 of their regulations that the mark "shall consist of two plates."

OCCASIONAL GOSSIP. By the Autocrat.

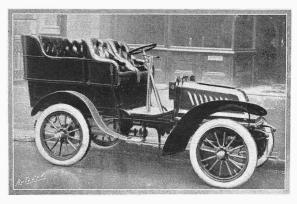
I shall not introduce myself to you, as I am not egotistical, and it would bore me more to write about myself than it would you to read about me. However, I had better clear the ground by saying that I am not a humorist. How is it, by the way, that so many people should pose as humorists nowadays? Members of Parliament, not to mention judges, and still graver dignitaries, seem to think that their remarks are not suitable for public consumption unless they are punctuated here and there in the newspaper reports by the word "laughter." No: I am not a humorist, nor am I a philosopher. I am only a man who has owned and driven motor cars since 1896—a few months after The Autocar was established.

x - x - x - x

I propose, with the editorial sanction, to discuss in this column from time to time matters which appear to me to be of interest to motorists. Some weeks I shall talk about the politics of our little world of automobilism; then, I may discuss the motor itself, or some incident connected with its use. At other times I may even refer to subjects connected with the industry, for, although I am an amateur motorist, I am, like most other people who are keen on the subject, not a little interested in matters concerned with the industry when they appear likely to have any bearing upon the improvement of the car, or in providing us with some advantage or convenience which we have hitherto lacked.

$$x \quad x \quad x \quad x$$

This week, the main topic in motor circles is the Automobile Club and the show question. I have been a member of the club from the beginning, and I am proud of my connection with it as a founder member, but I cannot say I am proud of its behaviour over the show question. When it decided two years ago not to give its patronage to any motor show till motor makers had become united in supporting one only, I thought this was a dignified position to take up, and withal a sensible one, but now, when there appears a possibility of the Palace show becoming more and more successful until it becomes practically the only show, the club has sold its patronage to the Agricultural Hall exhibition.

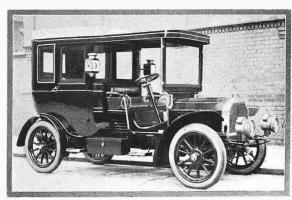


The new 8 h.p. single cylinder De Dion

In this I think it has made a great mistake in two ways. It should have adhered to its decision, and given its name to no show till one had obtained practically universal support, and, in any case, it should not have sold its patronage.

It is astonishing what divergent views different people take on this subject. The other day I met a well-known manufacturer and asked him what he thought of the club policy. He described it as mercenary and disgraceful, and really seemed hurt that the club—his club—should so far have fallen from its high estate as to sell its patronage for a Later, I came across a member mess of potage. of the club who regards all motor makers as an unprincipled set of people from whom the club should extract as much money as possible. He always makes it clear that he is only an amateur and not interested in motor manufacture, though he forgets to add that he made his money by buying horses cheap, and selling them dear to the War Office. Consequently, he looks down from a superior elevation on all persons connected with the manufacture of motors, and thinks they should not be allowed any voice in club management; in fact, it would be better in his opinion if they were all blackballed as they came up for election. Yet, this exclusive person seemed to think the idea of selling the club name was a splendid one. It would all increase the income of the club, and could be spent on the club house for the comfort of the members, said he. When I suggested that the club had much more important work to do than that of merely providing extra comforts for the comparatively few members who used it as a social club, he shrugged his shoulders and inferred that he was not interested.

I am afraid he will be very much annoyed when he realises that the money will not be spent upon the clubhouse, as the club committee begin to see what a mistake they have made, and they have decided to devote the £500 to good works, such as side-slip trials and road-resistance investigations. This is all very well, and far better than putting the money into the general club funds; but if trials can only be held by the sale of patronage it is time they were dropped, though I cannot understand this, as the entry fees for club trials are always rather high.



Sir Geo. Newnes' 24 h.p. Darracq, with double brougham body.

THE NEW $6\frac{1}{2}$ H.P. AND $8\frac{1}{2}$ H.P. HUMBERS.

The first illustration below shows the new 6. h.p. Humberette. This car is to all intents and purposes the same as the 5 h.p. Humberette, of which the company have sold so many. Having said this, little more remains to be done than to point out the essential features in which the higher powered car

differs from the lower powered one. In the first place, the engine, which has a bore of 35/8in., and stroke of 4in., developing at its normal speed the power stated above, is fitted with an ordinary type of centrifugal governor, which acts upon the throttle placed midway in the pipe between the induction Longuemare carburetter and the inlet valve. This is provided with a pedal actuated accelerator. In addition to the enclosed flywheels. a large diameter flywheel is keved to the crankshaft, and this is made to form one half of the conical friction clutch. A three-speed gear and a reverse are fitted to this car. It has a sliding type of gear with a direct drive on the top or third speed. One

feature of this gear is that the driver can pass from the first or low speed to the third or high speed without passing through the intermediate gear. The change is effected by a vertical lever placed on the left-hand side of the steering column, this operating the first, second, and third speeds, and having an out of gear position. On the right of the steering column is a similar lever which operates the reverse. The wire suspension type of wheels is retained, these being 28in. in diameter. The body, which is a two-seated one, is made extra wide so as to give ample seating room for the occupants, and it is provided with side doors—a most comfortable feature of the larger type of Humber cars. The weight of the car complete is about seven hundredweight.

A model de luve of this voiturette is being made in the Humber Beeston factory. It is in all essential features similar to the Coventry made one described on this page. The chief points of difference are the provision of side levers for the forward and reverse speeds, while wood wheels replace the wire



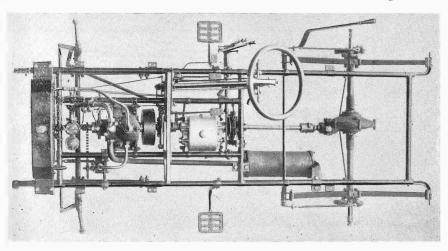
The 63 h.p. Coventry Humberette.

suspension type used in the Coventry made machine. The finish of the entire Beeston car is better carried out, though there is nothing whatever to cavil at in the sister car.

A few days ago we had an opportunity of inspecting the two volurettes in question, also the new $8\frac{1}{2}$ h.p. two-cylinder light car, which will, in our opinion, excellently fill up the gap which has existed in Messrs. Humber's catalogue between the well-known and successful 5 h.p. Humberette which its makers placed on the market early in the summer of last year, and which we illustrated in our issue of June 13th, and the larger 14 h.p. and 25 h.p. Humber cars.

The 8½ h.p. Four-seated Car.
Following the usual Humber practice, the

framework of this car is constructed throughout of steel The motor has a vertical water - cooled engine with two cylinders 3% ain. bore and 4½ in. stroke, and is solidly affixed by lugs on the crank case to a tubular underframe, through which pass two transverse tubular members. The normal speed is 1,000 revolutions per The transmission minute. is by a very light aluminium leather-faced cone clutch. which is contained in the flywheel, and so fitted as to prevent any end thrust on the bearing. This is operated by a pedal. The change



The 6½ h.p. Beeston Humberette chassis.

speed gear is of the usual sliding type, giving three speeds forward and a reverse. There is a direct drive on the top speed, giving twenty-six miles per hour, lifteen miles per hour on the second, and seven and a half miles on the slow; but, by the use of the accelerator, a speed of thirty miles per hour can be obtained, with a corresponding decrease on The drive from the change-speed the slow speed. gear to the live rear axle is by a universally jointed propeller-shaft and bevel gearing. The engine is fed by a Longuemare gravity fed carburetter, and is throttled both by a centrifugal action governor on the engine, and also by hand. The throttle valve, which is placed immediately between the two automatic inlet valves, is of a very simple but efficient type, consisting of a gunmetal cylinder with longitudinal slots, by which means a very elastic and efficient cut-off is obtained. The speed changing is performed by the usual quadrant mounted lever placed on the right-hand side of the driver. Two small levers are fitted inside the steering wheel to control the ignition and throttle valve, with the addition of a small lever on the dashboard for adjusting the supply of air to the carburetter. The usual Humber patent single arm steering wheel is fitted, thus giving perfect accessibility to these levers. The brakes consist of a double-acting foot-applied brake of large proportions and special design, which grips a drum on the primary speed shaft, in addition to which two self-supporting and compensated band brakes are fitted on the hubs of the

road wheels, these latter being actuated by a side lever. The steering is of the usual worm and segment type, and the beight of the steering wheel can be readily adjusted to suit drivers' requirements. The wheels are artillery type, 28m. in diameter, and are fitted with 3in. pneumatic tyres. The tank containing the cooling water for the engine is placed on the front of the car, the radiator being combined with it, that is to say, it is fitted in to a square space left in the centre of the cooling tank, by which means the greatest cooling effect is obtained, and also a great saving m space.

In conclusion, we may say that three things in connection with the design of this car particularly struck us, the first being the careful way in which the question of simplicity of handling and "getatableness" had evidently been considered. Secondly, the efficient way in which the lubrication of the bearings of both the engine and transmission had been carried out. To show how carefully this had been done, we may mention that a very efficient system of automatic ring lubrication is fitted on the journals of both the crank axle and the gear box, in addition to which the very important journal next the flywheel is provided with a wick lubricator. The third point was the excellent finish and roomy character of the coachwork and tonneau, the knee space in the latter being greater than is often found in cars of twice the horse-power. We may also add, from personal experience, the car is easy of control. a good hill climber, and very silent in its running.

THE DOUGILL ENGINE AND CARBURETTER.

One of the new features in motor car construction exhibited for the first time at the Crystal Palace Exhibition will be a 24 h.p. single cylinder engine fitted with a sympathetic carburetter. The balanced engine, which is of the horizontal type, has a single cylinder, the bore being eight inches. two crankshafts and flywheels, each crankshaft taking its position at each end of the cylinder, the two pistons travelling to and from each other at each revolution of their crankshaft, and, in conse quence, balancing the impact of combustion and the reciprocating motion of the pistons. The pistons are synchronised by a silent chain, running over chain wheels fixed upon the crankshafts, this chain also transmitting the power from the forward crankshaft to the rear crankshaft, upon which is fixed an expanding clutch, chain pinion, and epicyclic revers-This shaft being parallel with the live ing gear. back axle, a simple chain drive is all that is necessary to complete the transmission, throughout which there is no end thrust. The inlet and exhaust valve are in one casting, and are placed on the top of the cylinder, both mechanically operated from a sideshaft which turns one revolution to the crankshaft's four, thus enabling the use of double cams; the face speed of these being reduced, the phoger follows the contour of the cams much more readily. The

carburetter has four gravity fed oil leads, each being covered when the engine is stationary by short levers held in their relative position by light springs, and operated by the induced air current in the following manner. There are four round openings in the body of the carburetter, the combined area of which give the pre-arranged air speed to the motor at its maximum number of revolutions, the carburetter being then adjusted by closing three of the four oil feeds and tightening the tension of the spring on the air control levers, so that one only becomes operative. After starting the engine, release the tension on the second lever and open the oil feed by degrees; the engine then will be giving her full brake power up to two hundred revolutions per minute. moment the engine is accelerated No. 2 air and oil feed comes into operation, not by any spasmodic jerk but by degrees. When the second lever has opened to its limit then No. 3, and likewise No. 4 comes into operation through the increased speed of engine and induced draught. Thus the carburetter is adjusted, and the parts firmly locked entirely under the engine's load at all and every speed at which the engine may be designed to run. Altogether, this machine will provide one of the novelties of the show, which we venture to say will contain many detail improvements.

The gross takings of the late Salon d'Automobiles at the Grand Palais amounted to no less than £32.960.

The next meeting of the General Committee of the Motor Union will be held at 119, Piccadilly, on Monday, February 1st, at 5.30 p.m.

THE WORKING OF THE NEW ACT.

The First Case in Scotland.

In the Forfar Sheriff Court on January 22nd, Dr. Macalister, of Forfar, was fined 5s. for driving his motor car without having an identification plate fixed. It appeared that he went to register his car on New Year's day, but the County Clerk's office was closed, and he went again on the 4th, when the office opened and registered it, but he was unable to get number plates there. He ordered these straight away from a painter, but before they were finished he had occasion to drive his car for professional purposes, and was caught. There was no clause in the Act to excuse him, and he was made an example of for the benefit of others.

The President of the Local Government Board on the Act.

Mr. Walter Long. M.P.. President of the Local Government Board, speaking at the annual dinner of the Institute of British Carriage Manufacturers, made some reference to motor cars. These, he thought, had come to stay. In regard to the new Act, he said he had every reason to believe that it would be administered reasonably, for although at first some county councils were inclined to take advantage of a particular section of the Bill which enabled special regulations to be made in special districts, he had succeeded, he hoped, in persuading all the local authorities as to the desirability of treating the matter reasonably and upon its merits, and he believed they would work in that spirit. After a little while it should not be difficult to make the people of the country understand that the pace at which a car travelled was almost a matter of indifference so long as it did not endanger or inconvenience other users of the road. But motorists must realise that whether they drove slowly or fast, they must attend to the safety of the public who use the high road. Until the roads of this country had become very different, both in construction and in character, it would be impossible to use motor cars in the way in which many of their owners desired to use them. He thought that fact was coming home to motorists in general, and when

more of them fully realised it, much of the hostility which now existed would disappear. Naturally, members of the Houses of Parliament were sorry to impose restrictions upon motorists, but it was felt that, in many instances, they had, by their lack of consideration for others, brought the trouble upon themselves, for many of them chose to treat the high roads as if those roads belonged to them, and practically attempted to force the British public to "get out of the way." Naturally, the British public would not "get out of the way," and legislation had to be opposed to such methods. He sincerely hoped that it would lead to a satisfactory solution of the difficulty, which had threatened to become a very serious one.

Surrey.

The Surrey County Council, unlike the Surrey police, do not appear to be at all hostile towards motorists, but on the other hand to exhibit a reasonableness of attitude that is quite commendable. The committee charged with the administration of the Act have, in fact, decided to recommend the council not to fix any speed limit upon any of the Surrey roads under the new Motor Car Act, having decided to rely upon the provisions dealing with reckless or negligent driving. They have also decided that at present no steps should be taken to prohibit the driving of motors cars on any Surrey highways.

Middlesbrough.

At Middlesbrough it is proposed to adopt the following restrictions: That within a radius of one mile from the centre of the borough motor cars be required to reduce their speed to not more than ten miles an hour, those entering within half a mile to not more than eight miles an hour, and within a quarter of a mile to six miles per hour. The council have been requested to meet in the centre of the town to witness practical proof of the controllability of motor cars, but so far have not acceded to the request.

CLUB DOINGS.

Shelfield and District A.C.

The first report of the Sheffield and District A.C. shows that on December 51st there was a bank balance to the credit of the treasurer of £43 14s, after fifteen months' working on one year's subscription. The club was the outcome of a meeting convened by Mr. J. R. Wade in 1902, and the number of members is now minety-six. The work of the club is briefly sketched in the report, but the matters dealt with have been noticed from time to time in our columns. In summing up it is observed that the work accomplished could never have been done except by local automobilists being banded together in one association. The particular items instanced in this connection are the decision of the local authorities to abandon the ten miles limit, and the reduction of the affiliation fec to the A.C.G.B. and 1., including membership of the Motor Union and legal assistance therefrom, which the club is now able to enjoy at something less than half the cost of the original capitation. It is stated, in fact, that the business of the club has necessitated the committee meeting at least once a fortnight, and often once a week.

Manchester A.C.

The annual meeting of this club was held on January 15th, Mr. Fred Smith in the chair. The annual report, cead by Mr. Hoyle Smith, showed that the membership of the club was 166 as against 140 at the same time last year. There were twenty-one committee meetings and two extraordinary general meetings. The club subscribed \$16 towards the Gordon-Bennett race. The committee tried to get the Chester County Council to join with them in treating the roads with dust preventives, but without success. A circular letter was issued to all members asking them to reduce their speed in overtaking traffic, and to use great consideration to all other users of the road. Considerable correspondence has taken place with the Automobile Club of London during the year on the question of affiliation, a number of members being dissatisfied. Correspondence and negotiations followed, and

in the end a majority of the members voted in favour of a scheme of full affiliation, this, however, to be subject to the approval of the form of agreement which should be the approval of the form of agreement which should be submitted to the club for signature, upon which one or two rather important modifications were desired. The Chairman, in moving the adoption of the report, said the committee had been engaged in solid practical work. It had been active in dealing with district councils who proposed a ten miles limit. Referring to the question of affiliation, all had not have not that was wanted but more was known. all had not been got that was wanted, but more was known about the organisation of the London club than was known before. It was now known, for instance, that the funds subscribed would be definitely made use of for the interests of motorists all over the country, and not for the social part of the London club. Mr. Rees Jeffreys had assured the committee that separate accounts would be kept, and the subscriptions from the country would be dealt with in a separate balance sheet. At the present time it seemed desirable that all motoring interests should be able to present a united front. Perhaps, as should be able to present a united front. Perhaps, as public opinion became educated and people understood that the motor car was the safest vehicle upon the road, both to occupants and foot passengers, they would be more reasonable in their demands, and, among other things, might not insist upon a big light upon the back of a swift-moving car whilst heavy carts were allowed to wander about the roads at night practically unlighted Mr. Headridge seconded. Members who joined in the discussion, principally upon the affiliation question were Mr. Headringe seconded. Internets who joined in the discussion, principally upon the affiliation question, were Mr. Henriques, Mr. L. Schwabe, and Mr. Herhert Lee, and the report was adopted. The treasurer, Mr. S. Okell, read his report showing a balance of £156 in hand. It was decided to increase the subscription from one guinea to two the Chairman intimating that there might be to two, the Chairman intimating that there might be considerably more demand upon the funds of the club in the future, as it might be necessary to defend test cases. It was also desired to provide a garage for members' cars. The honorary treasurer and honorary secretary were re-elected. Votes of thanks terminated the meeting.

Bristol Bicycle and Motor Club.

At the annual meeting of the Bristol Bicycle and Tricycle Club, it was decided to alter the name to the "Bristol Bicycle and Motor Club."

Yorkshire A.C.

As many members have not yet paid their subscription, their attention is drawn to the rule which states that if it is not paid before the 31st January they are liable to lose the privileges of membership until it is paid. We mention this, as other clubs may be in the same position, and a rule of this sort might have a salutary effect upon forgetful members.

The Southern Motor Club.

A successful concert was held under the auspices of this club on Thursday last at the Avondale Hall, Clapham. An interesting programme was gone through under the direction of Mr. W. L. Lorkin (honorary secretary), who acted as musical director. Mr. Maynard, in the course of a few appropriate remarks, referred to the great success which the club had attained in the past season. The club's forthcoming events to be noted include a dance at the Avondale Hall, Clapham, on February 18th, and in the motoring season hill-climbing, reliability trials, garden parties, etc.

Lincolnshire A.C.

At a recent meeting of the committee Captain J. A. Cole, J.P., in the chair, and the president, Sir Hickman Bacon, Bart., being amongst those present, letters were read from Lord Willoughby de Eresby, M.P., and Mr. William Garfit, M.P., consenting to continue to act as vice-presidents of the club for the ensuing year. It was decided to hold an informal dinner at Boston on January 30th open to members and their friends, to be followed by a paper to be read by Dr. Gilpin, of Bourne, on "The Cost, Care, and Upkeep of a Motor Car." The club's annual dinner was fixed to take place at headquarters on April 15th.

Herefordshire A.C.

The annual meeting of this club was held on January 20th, when there were about twenty members present. Mr. J. T. Hereford, the president, occupied the chair. The honorary secretary, Mr. Wilfrid Groom, said the club now had fifty-eight members, twenty-eight of whom owned cars and thirty owned motor cycles. The balance in hand was £44 14s. 2d. The committee had considered the federation scheme proposed by the Reading A.C., but had

not seen their way to entertain it at present. The county council had decided not to apply for the closing of any roads to motorists or impose the ten miles speed limit. The three affiliation schemes of the A.C.G.B.I. were considered, and as a number of the members did not care for the club Journal, it was decided to go on the 5s. scheme. The outings for the ensuing season were left to the committee for arrangement, and it was decided to try and arrange to meet various other clubs on some of the occasions.

Scottish A.C. (Eastern Section) Annual Dinner.

The annual dinner in connection with the Eastern Section of the Scottish Automobile Club was held on Thursday last week in the North British Station Hotel, Edinburgh, Lord Kingsburgh, Lord Justice Clerk of Scotland, in the absence of the Lord Provost, Sh Robert Cranston, presiding. The principal guest was the Right Hon. A. Graham Murray, Secretary for Scotland, among the others being Colonel Borthwick, Colonel Duff, Major Portal, Dr. Dawson Turner, and Mr. G. Macmillan (honorary secretary). The royal toasts were given by the Chairman, who in proposing "The King" said that His Majesty was an excellent automobilist, the only difference, he remarked, between the King and themselves being that the King was not obliged to carry a number, while they were. Colonel Duff (Black Watch), replying to the toast of the "Imperial Forces," suggested that motor cars might be made more use of in war. A car might be constructed to contain one or two machine guns. The Chairman proposed the health of the "Secretary for Scotland." In his reply Mr. Graham Murray said for a great number of years before he started motoring he had been a cyclist. Referring to the Act, he said the discussion had revealed a terrible state of things on both sides. It had revealed a terrible state of things on both sides. It had revealed a termarkable prejudice against this new method of locomotion on the part of those who knew nothing about it. He could not say too strongly that the future of the sport really depended on their own behaviour during the next year or so. The speed limit in the country was now the only difficulty, but he warned them that if a limit of twenty miles per hour had not been accepted the Bill would have been lost, and he was pretty sure that with the growth of prejudice and feeling that had really been going on motoring would have been put an end to. The Chairman gave the toast "Automobilism," and remarked that whatever might be the restrictions he hoped many of them were only temporary. He advised automobilists to have a little pat

THE SHOW QUESTION.

Meeting of the Society of Motor Manufacturers and Traders

On Tuesday evening last a council meeting of the above society was held in the Blenheim Room at the Hotel Cecil, the president, Mr. Fred. R. Simms, occupying the chair.

Simms, occupying the chair.

The following member firms were represented: Messrs. Thornycroft, Ltd., the Motor Manufacturing Co., Coultbard and Co., Ltd., Jarrott and Letts, the Simms Manufacturing Co., De Dion-Bouton, Ltd., Ryde Motors, Ltd., the Farman Automobile Co., Ltd., the Sirdar Rubber Co., the Firefly Motor Co., Milts, Ltd., Theo, Chambers, Panhard and Levassor, Ltd., the London Motor Garage Co., the Durvea Motor Co., Humber and Co., the United Motor Industries, Ltd., Wilson and Pilcher, Ltd., Werner Motors. S. F. Edge, Ltd., Clement-Gladiator, Crossley Bros., Ltd., Straker, Ltd., the Motor Car Co., the Star Motor Co., Ltd., the Collier Tyre Co., Jo Lucas, Ltd., the Lanchester Engine Co., the Daimler Motor Co., Thrupp and Maberley, and the Weston Motor Syndicate, Ltd.

The minutes of the pravious council meeting were read and confirmed, and the council then passed to the consideration of the action of the Automobile Club of Great Britain and Ireland in the sale of the club's patronage to another and later show. The subject was discussed at some length, but the general consensus of opinion was to the effect that the society's show would not suffer by the action of the club, although the same was very much to be regretted in view of the resolve made public by the Automobile Club less than two years ago to the effect that it would favour no show until the industry and trade were united upon the subject. However, in order that the position of the society's exhibition might be put in a

proper and unmistakable light before the automobile public a letter to be sent to the press generally for immediate publication was drafted and agreed upon. That letter we give hereunder:

To the Editor of -

The Society of Motor Manufacturers and Traders' Exhibition at the Crystal Palace.

Sir,—We shall be glad if you will permit us to state that the annual show of this society, which cepresents practically the entire industry in this country, will be held at the Crystal Palace from the 12th to 24th February next.

With the object of ensuring a thoroughly representative exhibition, the leading manufacturers and traders in this country some time back entered into an agreement to exhibit only at the society's show.

As a result, the whole of the available space at the Crystal Palace has been allotted, and its success assured, notwithstanding the fact that the Automobile Club has decided for a pecuniary consideration to give its patronage to another exhibition to be held at a later date, at which exhibits from those who have signed the above agreement will not be found.

It is not for us to criticise the action of the Automobile Club, but we think it right that the above facts should be made known.

should be made known.

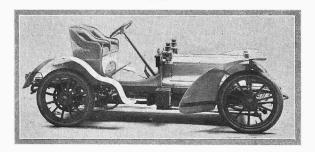
I enclose list of exhibitors showing those which have agreed to exhibit only at this society's exhibition.

Yours truly

Yours truly,
(Signed) T. F. WOODFINE,
Secretary Society of Motor Manufacturers and Traders.

After discussion it was agreed by eighteen votes to one that an agreement as to the 1905 show should be entered into by the members of the society as last year. The question of an advance in the date of the show was also considered.

On the motion of the Chairman, the following firms were duly elected members of the society: The Bat Motor Mfg. Co., the Minerva Motors, Ltd., the Cadogan Garage Co., Ltd., the Rex Motor Co., Ltd., and the Clipper Tyre Co., Ltd.



A Peugeot flier.

THE CHAIRMANSHIP OF THE CLUB.

The chairman of the Automobile Club. Mr. R. W. Wallace, K.C., has sent in his resignation, as he finds it impossible to longer devote sufficient time to enable him to continue to discharge the operous duties of his office. He has been asked to defer his resignation till the end of the present club year, next month, and to accept a retaining fee, in respect of his services as standing counsel to the club, of 500 guineas for the current club year. Great exception has been taken to the voting of this money by some critics of the club, but we do not regard it as a matter which concerns anyone except the members of the club. We criticise the club policy freely when it has any bearing upon the welfare or otherwise of the automobile world at large, and, while we have our own opinion on the subject as private members of the club, we do not think a matter of this kind need be discussed elsewhere than in the pages of the club Journal itself. Mr. Wallace has done good work to the club, and devoted an immense amount of time to its welfare, and, despite what may have been said to the contrary, it would have been difficult, if not impossible, to have found a man who would have done so well as he has in the position he has occupied for so long. If he has erred it has been in his intense desire for peace. As a chairman he has not always conducted the meetings in such a way as to lead to definite results, this being due, more often than not, to his determination that nothing like a bitter discussion should be permitted, and rather than this should take place he would closure a matter altogether. In most cases his desires for peace have been provocative of good, but there are instances in which a little less urbanity and a little more backbone, while offending a few, would have enabled lasting agreements to have been made in place of short-lived compromises. However, this conciliatory spirit is unquestionably better than anything approaching to partisanship. The selection of a successor to Mr. Wallace will be a very hard task indeed. The duties are onerous; they require a man of position, influence, ability, and

considerable leisure one who is enthusiastic over automobilism and its good generally, and at the same time absolutely above suspicion. He should be not only entirely independent of the industry, but he should have no connections or interests of any sort which can be translated by his enemiesand if he does his duty he must make some - into a reflection upon his good faith. It is easy enough to define the main qualifications of the ideal chairman, but the difficulty is to find them combined in one man. There are plenty of men with two or three of them, but few indeed with all. It is a very open question whether it would not be better to have a salaried official chief, who would relieve the chairman of much harassing routine work. In any case the matter is one of very considerable importance to the automobile world at large as well as to the club, for the strength and ability of the chairman have a great influence upon the policy of the club, and that in its turn is of importance to the average motorist, whether he be a member of the club or not.



Photo by

OUSTED BY THE ACT. Miss Violet Hely, dughter of Mr. C. W. Hely, of Rathgar, Dublin, at the wheel of her 10 hp. Panhard, wnich, under the age limit of the Act, she will not be permitted to drive for nearly two years, she being at present only just over fifteen. Though of an age at which a grandmot crly Government thinks it unsafe to have charge of a car, Miss Hely has been driving for upwards of eighteen months, and handles her car with such ease and skill as a mere man might eovy.

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