

THE AUTOCAR

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

EDITED BY H. WALTER STANER.

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THE AUTOCAR.

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COLONIAL AND FOREIGN EDITION.

IN ADDITION TO THE USUAL EDITION OF "THE AUTOCAR," A SPECIAL THIN EDITION IS PUBLISHED EACH WEEK FOR CIRCULATION ABROAD. THE ENGLISH AND FOREIGN RATES WILL BE FOUND ON THE LAST PAGE. ORDERS WITH REMITTANCE SHOULD BE ADDRESSED "THE AUTOCAR," COVENTRY.

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Notes.

International Automobile Sport.

So far the sport of automobilism between the nations has been conducted in the most amicable and pleasing manner. Little incidents have occurred, it is true, which have marred it somewhat, but they have been but momentary, and a belief has been generally expressed that they were due to a misunderstanding rather than to bad sportsmanship.

At the same time, little heartburnings and misunderstandings must occur in international sport. For instance, while Englishmen have always recognised that perfectly fair treatment was eventually meted out to the English winner of the Gordon-Bennett cup, despite all agitation to the contrary, and to the credit of the French, be it said, right in the face of their own national sentiment, yet it has been felt by some that the decision in the big car class for the Paris-Vienna race was not an altogether just or sporting one, and many still maintain that Count Zborowski and his Mercedes were scarcely fairly dealt by. However, so far the history of automobile sport has been a record of pleasant international courtesies with only a very few misunderstandings. At the moment, however, it can scarcely be said that the Sports Commission of the French Automobile Club are doing their utmost to meet the English club with regard to the Gordon-Bennett course, but we hope in this connection it will not be necessary to say more. There was a time when France did not know what sport was; but we believe this has largely passed—at any rate, so far as the newest of all sports is concerned—and we hope nothing will occur to shake our faith in the good sportsmanship of the automobilists of France.

Accessibility.

It will be recollected, from the report which was published in our pages of the meeting at the Automobile Club on December 9th to discuss the 1903 reliability trials, that the chief points wherein the trials this year will differ from those of last will be the fact that they will be continued for eight days, so that 1,000 miles will be the total distance covered instead of 650, and absolutely every adjustment, replenishment, and cleansing of the car will have to be done on the road in the running time and under official observation. The further details are being arranged by a joint committee representing the club and the members of the industry, and in due time the regulations drafted by them will be made public. In the meantime, we would urge upon them, in addition to points which have already been brought up, the desirability of giving proper consideration to accessibility, or else to dispense entirely with any marks for the conditions of the mechanism of a car after the trials. It will be remembered in the last trials that the gears of some cars were merely reported as inaccessible. No marks were deducted for gears being inaccessible, for we suppose the judges were aware that that term was only used in a comparative sense; of course, an inaccessible gear could not be constructed. At the same time, the finding was one-sided, and must have borne hardly upon someone—that is to say, the cars which had readily accessible gears got no credit for accessibility, but might

have marks deducted because their gears were worn unduly; whereas the so-called inaccessible gears had no marks deducted for condition because the judges did not have them opened up, and yet they were not penalised in any way for having gears so difficult to get at. We should like to see the whole question of accessibility taken up from a practical standpoint at the trials with a heading of its own and stated maximum of marks. Accessibility is one of those qualities which can be easily overrated, for a good car does not require frequent pulling to pieces; but, on the other hand, there are certain parts which must have regular adjustment, and which, sooner or later, may require attention, and these should all of them be as accessible as possible. By accessible we not only mean that it should be easy to get at the parts, but that the operations of removing their fixings or covers should be as simple as compatible with a thoroughly sound job and a workmanlike fit. For instance, on all the best engines valves are nowadays most easily get-at-able, but there are some machines so arranged that, while this is the case with the valves, the position of other parts of the car is such that the operator requires to be almost a contortionist to get at them. To avoid what may be termed needless accessibility, it would be well if the trials committee were to specify the particular parts which should be accessible, and which would be judicially examined for accessibility, and those parts which should be most highly marked for this quality, of course, would be the ones which, in the majority of makes, require the most frequent adjustment. For instance, it is much more desirable that the clutch should be very readily adjustable than that it should be ridiculously easy to take out the change speed box, as one may require attention on the road and in any case will want periodically looking after, whereas the other is an indoor job, and, while it should be as simple as possible, may be viewed from an altogether different standpoint.

Another British Success.

Too late for inclusion in our last issue, we were advised that the Wolseley Tool and Motor Car Co., Ltd., were awarded a gold medal for elegance for their exhibit at the French motor show. The prominent recognition which both British exhibitors have obtained at the hands of the French judges should be a great encouragement to the members of the home industry, not necessarily to spur them to exhibit themselves, but as an indication that sound British workmanship is appreciated even in a quarter where national sentiment might be expected to cause a suspicion of visual aberration. At the same time, we do not think either the Napier or the Wolseley exhibit showed the British firms at their best. The sound workmanlike finish of the Napier chassis was lost beside the hand finish and high polish of the vast majority of the foreign frames. However, everyone qualified to judge was well aware that these hand-burnished exhibits were not fair samples of the French firms' everyday work. On the other hand, the Wolseley exhibit lacked a chassis, and that we regretted exceedingly, because the Wolseley transmission is so remarkably efficient that it is worthy of staging in a manner which would enable it to be critically examined by the French motor public, as it is one of

the very few successful attempts which have been made to obtain a transmission with all the shafts parallel; in other words, to eliminate bevel or rectangular transmission of power.

Unfair Criticism.

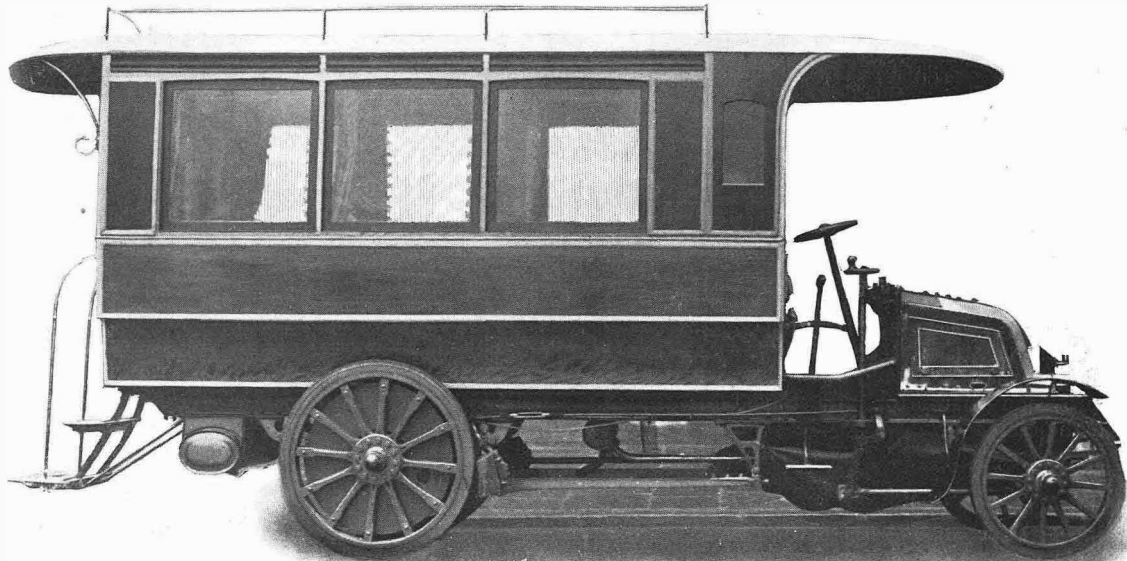
Last week we referred to the fact that, while it was fashionable to criticise the horizontal engine unfavourably, the majority of the critics did not see fit to go into details, and they merely objected to the horizontal position because it was in the minority, so far as motor car work was concerned. Of course, when internal combustion engines for all purposes are concerned, it will be found that the bulk of them are horizontal and not vertical. As an instance of the kind of criticism which has been rampant, and which is unfair because it is quite inaccurate, we may quote an evening paper which recently stated that horizontal engines were as obsolete as muzzle-loading guns. When we consider the practical results which have been obtained by the horizontal engine, and also bear in mind that in the reliability trials for two years in succession cars with horizontal engines have been the only ones which have gained two gold medals in each series of trials, we think it is, to say the least, superficial to attempt to condemn the pattern in this manner. Moreover, in criticising the position of the engine, the intent of the designer of the car as a whole should be considered. To take the four gold medal cars referred to above—the Wolseley—it should be remembered that the form of transmission employed on these vehicles could not well be adopted with any other position of engine except, perhaps, the diagonal or inclined type, and this would result only in placing some of the weight higher; in other words, it would be a disadvantage. However, we think the upholders of the horizontal pattern are quite strong enough to fight their own battles, and that the practical results which have been already obtained with this type of engine, and those which will be arrived at in the future with it and other horizontal makes, will show that our prophecy, to the effect that the horizontal engine is bound to remain a standard pattern, is absolutely correct.

After the recent marriage of Mr. Kenneth Balfour, M.P., to Miss May Broadwood, the bridal pair left for Bath to begin an autocar tour in Cornwall and Devon.

* * *

A writer in a contemporary satirically compares the motor car with the four-horse coach, and asks whether the world is going to be better worth living in when we are all "motorised." To him, the cheerful music of the coach horn was more acceptable than the present "pneumatic hooter," and he wonders what his grandmother would have said at the sight of people in leathern coats and black goggles. We are far ahead of our grandparents, however, and the word "motorised" is only another way of saying that we are in a tearing hurry about everything. He prophetically avers that the sport of the future will not be hunting, or football, or cricket, but simply the pursuit of balloons in motor cars. Does our friend know the worth of a prophet in his own country?

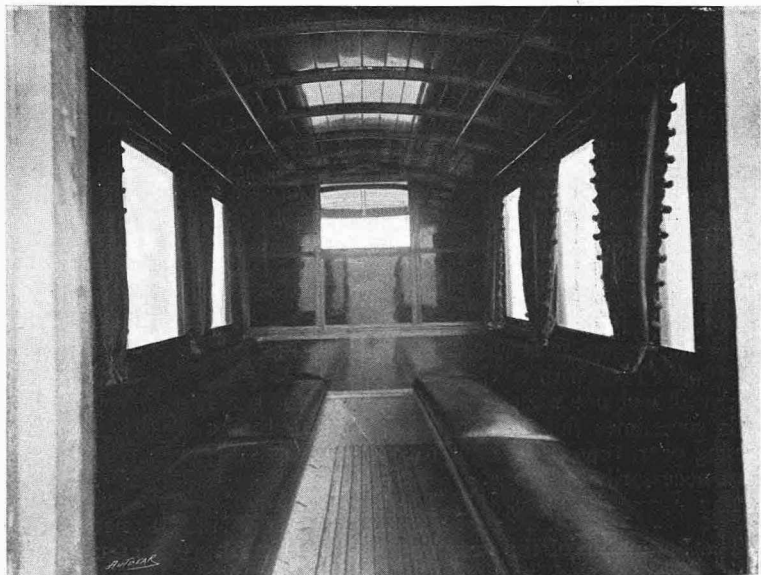
THE MILNES-DAIMLER MOTOR OMNIBUSES.



The accompanying illustrations show the exterior and interior aspects of the 16 h.p. public service cars which Messrs. Milnes-Daimler, of "Motoria," Balderton Street, Oxford Street, W., are now supplying for passenger service in the Metropolis. The frame upon which the body is carried is of channel steel, supporting a tubular underframe, to which the engine and gear box are attached. The engine has four cylinders of 3.5 in. bore and 5.11 in. stroke, giving 16 h.p. on the brake at 950 revolutions per minute. The engine is throttled governed on the induction pipe, the throttle being controllable independently of the governors by the driver. The drive is taken to the change-speed gear through the ordinary form of conical friction clutch, the gear affording four speeds forward and a reverse, and thence by a longitudinal universally-jointed shaft to the countershaft parallel with and directly over the rear axle. The countershaft, of course, carries the differential gear at its centre, and at either end has pinions meshing with internally-toothed drums bolted to the road driving wheels. The steering wheels are 2 ft. 7½ in. in diameter, and the rear wheels 3 ft. 5¾ in. All four are shod with 5 in. endless solid Good-year tyres, of the wearing qualities of which Mr. Burford, the managing director of the Milnes-Daimler Co., speaks in the highest terms. The crankshaft and gearshaft bearings are all lubricated by forced feed lubrication from a supply tank set on the dashboard in view of the driver. The engine is cooled by water circulated through the cylinder jackets and a Cannstadt marine type cooler set in the front of the bonnet by a rotary gear-driven pump. At the

normal speed of the engine this pump runs at 1,200 revolutions per minute. The cylinders are fired by current from a Simms-Bosch rotary magneto, gear driven like the pump. Two extremely powerful brakes are fitted—one a double-acting band brake of large dimensions on the rear end of the secondary gearshaft, and applied by pedal; and the other, Price's well-known tyre brakes on rear wheels actuated by side lever.

The omnibus body is constructed to carry twenty passengers—eighteen inside and two beside the driver. Each passenger has sixteen inches of seating space, and there is ample space between the seats, as will be seen from the illustration below. Similar cars to these are now successfully running in various parts of the country.



View of the interior from the conductor's step.

USEFUL HINTS AND TIPS.

On Buying a Second-hand Car.

We next arrive at the transmission gear, but this we must deal with very broadly, as there are so many adaptations of the various systems. The first part of the transmission is the clutch, and as this is usually of the conical friction type, there is but little to do here. With the hand, depress the clutch pedal and see that the male cone is withdrawn clear of the female cone without any excessive force being used, and that the male cone returns into engagement freely. If the male cone can be withdrawn sufficiently to examine the leather facing, it should be seen if this is in good order and not worn down too thin. While the male cone is out of engagement the clutchshaft should be tried for wear by lifting it at the cone. It should also be noted that there is provision made for adjusting both the clutch and the clutch pedal.

x x x x

It will be necessary to lift the lid off the gear box to inspect the change speed gear wheels. The teeth of these wheels should show a brightly burnished surface on the faces, but not necessarily on the tops and bottoms. By "faces" is meant the breadth of the teeth which engage with the opposite wheel. If they show as brightly here as they do on the faces they have been intermeshed too deeply in the first place, and there is likely to be excessive wear. If they show dark or lightly touched surfaces, they have been correctly set, and they should be in good running order; in fact, they will probably be better than new. Each of the wheels should be looked at all the way round to ascertain that no teeth are broken. If the sliding type of gear—that is, a type where the wheels are slid into engagement sideways—be in the car under notice, the edges of the teeth should be looked to. If the car has been in good hands, the teeth will show brightly on their engaging sides; but if the driver has been at all clumsy it will probably be found that the teeth are badly chipped at these points. The speed-changing movements should all be closely watched while manipulating the actuating lever. The wheels on the sliding sleeve should move deliberately and accurately into their corresponding wheel—that is, provided the teeth are not opposite one another. The edges of the wheels should be in a perfect line, not one overhanging the other; if this is the case, it indicates a lot of lost motion in the connections between the sleeves and the actuating lever. A certain amount of latitude is permissible here, but the movement should not be more than what might be termed "a little free." If there is a lot of "backlash" there is something wrong somewhere, and it should be carefully looked for with a view to correction. If the total width of one wheel exceeds that of the other, as is sometimes the case, particularly with the reversing gear, then it does not follow that something must necessarily be wrong.

x x x x

The bolting up of the gear box to the frame also should be inspected, particularly for signs of straining. Its oil-retaining and dust-excluding capacities should be attended to, otherwise trouble is likely to

follow. After the shaking up of a few thousand miles the lid of the box sometimes develops a tendency to rattle, by reason of the catches working loose; where studs or bolts and nuts are used for this purpose, there is no fear of the lid coming adrift. The countershaft bearings and differential gear should be looked to and tried as far as is possible, and the side chains carefully inspected. These and the sprocket wheels should be examined most carefully, as they are the last stage but one in the transmission system, and, moreover, invariably have to run entirely exposed. Hard, gritty, sandy mud acts as an abrasive upon both chain and sprockets, cutting them about very badly, if the car has had much running in bad weather in sandy districts. The forward or wearing side of the teeth is likely in time to become concave in form instead of convex, thus interfering with the chain leaving the wheel freely. As to the chains, the principal part is the side links upon which the greater strain comes. If these appear to be cut or distorted and want renewing, it should have an effect upon the price of the car. With the live axle and bevel gear a lot will have to be taken on faith without opening up the whole of the gear box containing it.

x x x x

In the foregoing of this series we have dealt with a lot of things that are possible to occur or to be found in a second-hand car. Perhaps one or two of the points we have mentioned may be found in a car, but it does not necessarily follow that because one or two are noticed they must all be there. Other defects, or apparent defects, which have not been noted here, may be discovered, and if the prospective buyer should feel himself at all out of his depth he should obtain advice before completing the purchase of the vehicle. There are many other little points for inspection, but as these are confined to individual vehicles and cover such an extensive ground, we are quite unable to deal with such here to the exclusion of other matters. Once more would we impress upon our readers the necessity of discriminating between fair wear and tear and bad use. In such parts as the steering connections, governor, carburetter, ignition, and other connections, there will be some looseness, and allowance must be made for this. It is only excessive wear or bad fitting that need examination. In the case of the motor and gearing, only a practical and well-trained engineer would be capable of discriminating between fair wear and misuse. In this matter, however, the state of the teeth in the change speed gear is a fairly clear indication of bad usage, which has created excessive wear and undesirable strains all through the driving mechanism. Tyres are a most important consideration, and have a large bearing upon the price of the car, as their replacement is a heavy item in expenditure. When one has examined a likely car, it is as well to make an estimate—and a fairly liberal one—for any adjustments and replacements which may be thought necessary, and this amount should be added to the purchase price of the car. As we said before, frequently the amount spent in alterations, repairs, and replacements mounts up to a sum sufficient, with the capital, to have purchased a new car.

A SHIP OF THE ROADS.

The 16 h.p. Napier car, shown by the two accompanying illustrations, has been supplied by Messrs. S. F. Edge and Co., of 14, New Burlington Street, W., and fitted by the Coupe Co., of 14, Regent Street, W., with a body of somewhat novel design supplied by the owner. Mr. Stuart Ogilvie, who is the well-known dramatic author, is an ardent convert to automobilism. He depends entirely upon the reliability of his Napier car not only for tours, country calls, and shoots, but for station work and business appointments, and has disposed altogether of his horses and carriages.

So far as the engine and change-speed gear are concerned, these are those of a standard 16 h.p. Napier, but in order to take the owner's special body, the channel steel frame has been particularly constructed. The artillery-built road wheels are (fore and aft) 36in. in diameter, and are shod as to the drivers with the well-known and most durable Sirdar Buffer tyres (solids); and as to the steering wheels, with Midgley's armoured pneumatic tyres. In the conception of the body, Mr. Stuart Ogilvie has endeavoured to embody therein numerous conveniences which, up to the present, are not commonly found on automobiles. It will accommodate six passengers, including the mechanic. The central seat within the brougham body is raised nine inches above the driving seat in front for the purpose of giving those occupying it a good view of the road forward, which, of course, cannot be obtained in the seats of the ordinary double phaeton-bodied cars, where the occupants of the vehicle all sit on the same level. These seats, as can be seen, are most adequately protected by a hood, which when down forms an efficient dust screen for the passengers. This hood is so designed that by the addition of two detachable side columns and a roof section, all of which are carried on the car, the vehicle can be converted from its open form into a single brougham or landaulette in less than three minutes. This covered portion of the vehicle is intended for refuge in bad weather and for night driving.

The rear spider seat is level with the central or hooded seat, and accommodates, too, the mechanic and a passenger when the former is not driving.

This overcomes the difficulty of finding a seat for the driver without having to depose a passenger.

The question of baggage, carriage, and stowage has had the particular attention of the gifted writer. Beneath the central seat is a boot, on the lines of that of the old-fashioned mail coach, access to which is obtained from the rear. This boot accommodates two canvas dress cases, each 29in. by 19in. by 13¼in. Under the spider seat a large dustproof tin box, made like an uniform case, is

accommodated. This case measures 30½in. by 18½in. by 10in.; and Mr. Ogilvie trusts that these dimensions will satisfy the requirements even of a lady passenger. On the underside of the boot or box provided for this case are slotted carriers, which carry the brougham top and side columns when these are unshipped. Upon the footboards of the spider seat being raised, two trays are discovered,

divided into several suitable compartments, to take all necessary spare parts and tools.

Nor do the above particulars exhaust all the conveniences of this remarkable body. The box seen below the frame gives shelter to the Castle and Bleriot lamps during the day, and when this landcraft is commissioned for a long trip, picnic, or shooting parties, the box will accommodate extra baggage or a luncheon hamper, guns, ammunition, etc., the lamps meanwhile remaining on their brackets. When not in use, the brougham seats are protected by a waterproof covering, which can be stowed beneath the box cushion of the spider seat when not required.

The body is finished in "Napier" green, with black mouldings picked out red. The wheels are in red to match the lines, and picked out with broad green lines of the body shade. The upholstery is in green

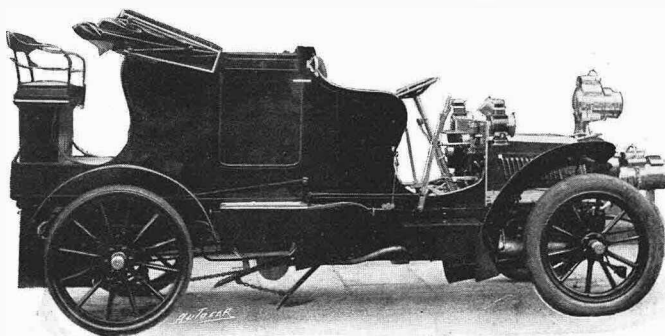
morocco, with rich broad laces throughout.

The car has been christened, and will answer to the name of "Stai," the warning cry of the Venetian boatman as he swings his gondola round a corner on the wrong side.

We believe we are correct in saying that Mr. Stuart Ogilvie was for many years a Surrey magistrate, and graced the benches of both Kingston and Guildford, but a fate cruel to automobilists of the South has spirited him away to the eastern counties, where, nevertheless, we feel assured he will spare no effort to temper magisterial prejudice wherever it shows itself.



The Napier with the hood up



The hood down.

THE CHENARD AND WALCKER 14 H.P. CAR.

The special features which have been embodied in the cars turned out by Messrs. Chenard and Walcker, of Asnières, Seine, have already been referred to by us. We are now able to give illustrations and diagrams, which will serve to make clear the particular construction of these vehicles, shortly to be exhibited at the Crystal Palace.

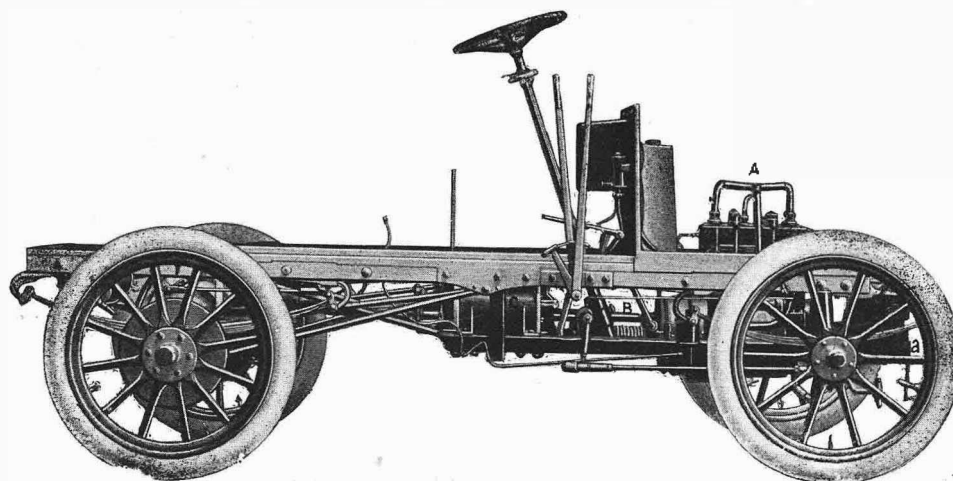
wheel in the usual way. The radiators are set in front of and below the frame, while the water tank is carried on and in front of the dashboard beneath the motor bonnet. A carburetter of the Longuemare type is employed. The Chenard-Walcker engine has both exhaust and induction valves mechanically actuated off separate layshafts, and

possesses two other distinctive features. The first of these is the setting of the specially-formed induction valve-lifting cams on a sleeve sliding on a fixed shaft. The cams are so shaped that the induction valves are held fully open for a longer or shorter period, as demanded by the speed of the engine, or desired by the driver of the vehicle. The sliding cam sleeve is controlled by the centrifugal governor and

moved to and fro, thereby bringing the cams under the exhaust lifting rods in positions to retain the induction valves open for a suitable length of time. By this arrangement any wire drawing of the charge which obtains in so many of the induction valve governing systems is avoided, and sweet and noiseless running of the engine is obtained. This arrangement permits of a variation of engine speed of from 50 to 1,200 revolutions per minute, thus securing extraordinary elasticity of drive, approaching that of steam. The other distinctive feature of the engine, or rather of its firing, is the use of a single contact commutator. By means of this, a spark occurs in both cylinders at the same time; but as one occurs in the burnt gases in course of expulsion, it has no effect. Absolute exactness of advancement

and retardation in both cylinders are thus obtained, in addition to a welcome simplification in that important organ, the commutator. Dash lubrication is depended upon for the sufficient oiling of cylinder walls, connecting rods, and crankshaft bearings.

Another feature of the Chenard-Walcker construction is the design of the friction driving clutch, which can be clearly gathered by reference to fig. 3.



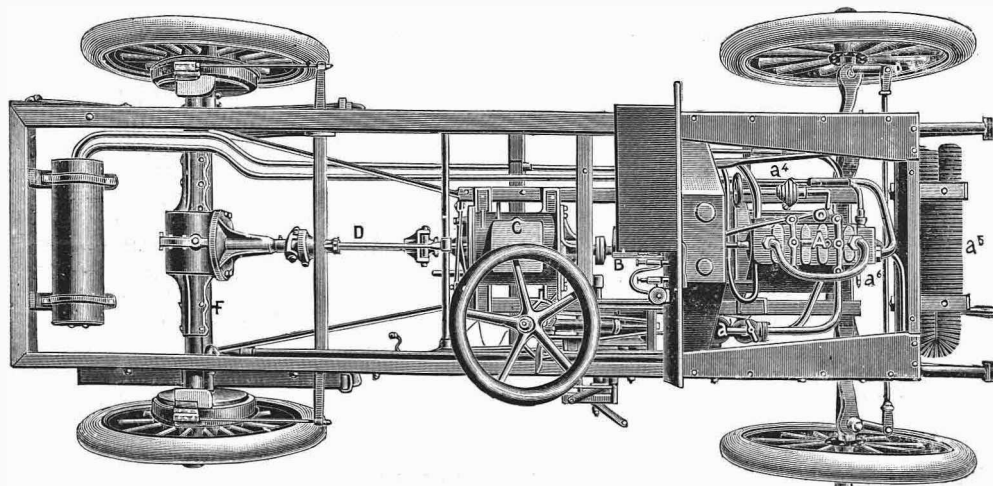
A, motor.

Fig. 1.—Elevation of chassis.
a, radiator. B, clutch.

C, gear box.

Fig. 2 shows the chassis as photographed in plan. The frame is of wood strengthened and stiffened by longitudinal cambered steel fitch plates. It is supported on the forward and rear axles by semi-elliptical springs of more than average length. By means of a strongly-braced steel underframe, the whole of the driving mechanism—to wit, engine, clutch, and change speed gear, but excepting the differential gearshaft E (fig. 5) lying in the vertical plane above the fixed axle F—is carried on the main frame.

As shown in figs. 1 and 2, the engine has two cylinders (one casting), the internal diameters of which are 4in. and the stroke 5½in. The engine, of course, is water-cooled, a centrifugal circulating pump being driven off the flywheel by a friction

A, two cylinder engine.
a, carburetter.
a¹, water circulating pump.Fig. 2.—Plan of the chassis.
a², radiator.
a³, commutator.
B, clutchC, gear box.
D, propeller shaft.
F, road wheel axle

The female coned portion of the clutch is not formed within the rim of the flywheel, as is generally the case, but is an independent member D D driven off the flywheel by the segmental studs D¹ D² in the before-mentioned figures. The female cone so driven is solid with its own boss, which runs loosely on the clutchshaft B. The web of this cone is prevented from exerting thrust on the rearward face of the flywheel by the flange B² on the forward end of the clutchshaft B. The male portion of the clutch A A, which forms part of a moving collar, sliding on the squared portion of the clutchshaft B, is formed, as may be seen, with a reversed cone surface F F. By the 'llest

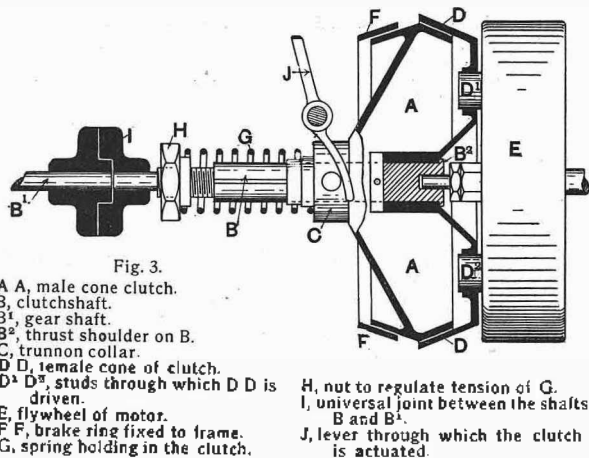


Fig. 3.
A A, male cone clutch.
B, clutchshaft.
B¹, gear shaft.
B², thrust shoulder on B.
C, trunnion collar.
D D, female cone of clutch.
D¹ D², studs through which D D is driven.
E, flywheel of motor.
F F, brake ring fixed to frame.
G, spring holding in the clutch.
H, nut to regulate tension of G.
I, universal joint between the shafts B and B¹.
J, lever through which the clutch is actuated.

depression of the clutch pedal or the brake pedal, the clutch collar is caused to slide rearwards along the squared portion of the clutchshaft, until the reversed male cone surface is brought into braking contact with the inner periphery of the coned ring F F, which is attached to the frame of the car. As we can vouch from personal test, this gives a most powerful form of foot brake, and though the arrangement may suggest undesirability to some by reason of the fact that the braking stress so applied must obviously pass through all the driving gear to reach the road wheels, yet Mr. Walcker assured us that they had had the system in use for a considerable time on many cars, and it had proved most satisfactory. An examination of fig. 3 will show that owing to the stop formed by the flange B² to the male cone boss there can be no thrust on

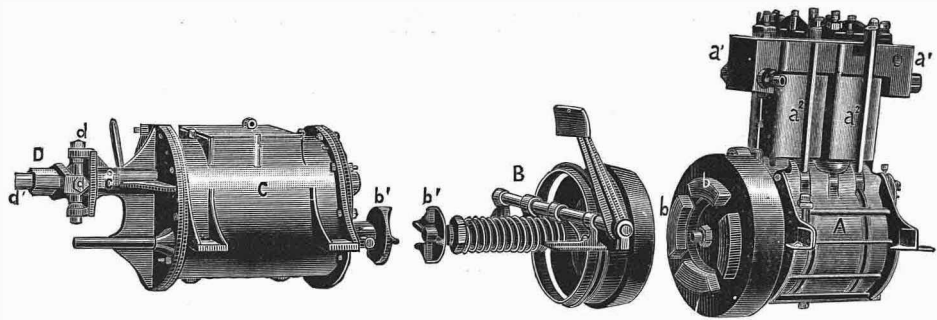


Fig. 4.—The driving mechanism.
A, crank chamber.
a¹ a², cylinder heads.
a³ a⁴, cylinders.
b, driving bosses on flywheel.
B, clutch.
b¹ b², universal joint.
C, gear box.
C¹, drivingshaft from gear box.
D, universal joint.
d d, right angle pins in D.
d¹, propeller shaft.

the engine bearings in the first case, and by the clutch spring adjusting nut H taking the thrust of the spring G from the gearshaft bearings in the second case. The clutchshaft forms a sufficiently flexible connection between the rear end of the engineshaft and the forward end of the primary gearshaft by means of a thimble bearing on the former, and a similar bearing on the end of the latter.

The connection between clutchshaft and gearshaft is more definitely shown in fig. 4, where the engaging connections on the two shafts are marked b¹ b². In this figure, C is the gear box in aluminium, which contains a sliding type change speed gear with gearshafts in the vertical plane, affording four speeds forward and one reverse. The sliding sleeve carrying the change speed wheels is upon the lower or primary shaft. In order to reduce the length of the gearshafts, the two pinions giving the fourth speed are always in mesh, that upon the primary shaft being loose thereon. The sliding sleeve is formed with a mechanical clutch on the end nearest this loose pinion, the web of the latter being made with a corresponding clutch. When these two are locked into each other, the drive passes through the loose pinion to the pinion fast on the secondary shaft, with which it is engaged. From the secondary gearshaft the drive is taken by the propeller-shaft D (fig. 2), which has a universal joint at each end. The forward joint is seen in fig. 4, marked D d¹. The forward end of

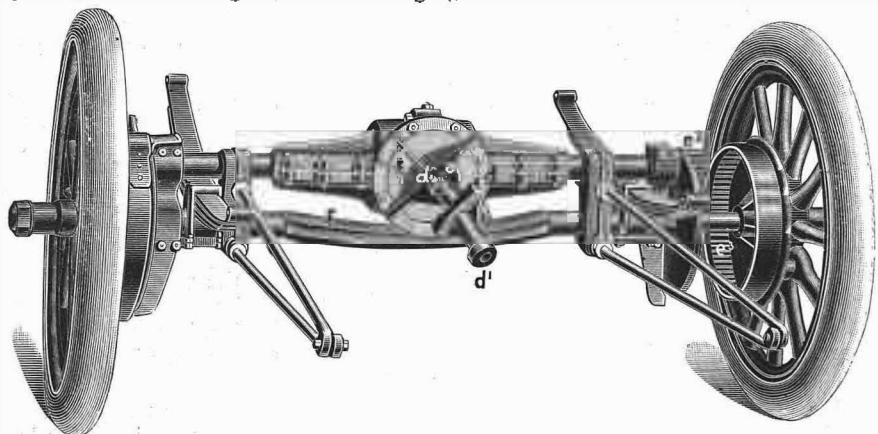


Fig. 5.—The rear driving axle.

E, live driving axle.
F, road wheel axle.
d, universal joint on propeller shaft.
d¹, propeller shaft driving from gear box.
e, bevel and differential gear box.
e¹, pinion on drivingshaft.
e², internally toothed wheel fixed to the road wheel.

the propeller-shaft is permitted longitudinal play in the collar \mathcal{A}^1 (fig. 5). The propeller-shaft lies normally in the horizontal plane.

The rear axle F (fig. 5) is a fixed axle secured to the springs by shackles and plates in the usual way. The road driving wheels rotate on the ends of this axle, and each carries upon the inner end of its hub a strongly-webbed internally-toothed ring (see right-hand side of fig. 5).

The differential gearshaft, which is rotated by means of bevel gearing from the propeller-shaft, is carried in the differential gear case e , the projecting sleeves of which are mounted in vertical standards on the fixed axle. To these standards are attached twin angular radius rods, which preserve the absolute parallelism of the live and fixed axle. On the outer ends of the differential gearshaft are toothed pinions (see e^2 , fig. 5), meshing with and driving the internally-toothed rings or drums on the road wheels. The outer peripheries of these internally-toothed rings are made to serve as brake drums upon which powerful double-acting compensating band brakes are applied by a lever set with the gear changing lever on the right of the driver.

That the above system of drive is particularly efficient is sufficiently proved by the triumphs of this car in the Criterium de Consommation held under the auspices of the French Government on February 5th and March 5th of last year, when a Chenard and Walcker car, which had already run 7,400 miles, ran 62.1 miles, carrying four persons, making a total weight with car of 1 ton 1 cwt. 0 qrs. 2 lbs., on a fraction over one and one-fifth gallons of petrol. There is nothing in the construction of the car to account for this but efficiency of transmission. These cars are about to be imported into the United Kingdom and colonies by the Weston Motor Syndicate, of 14, Mortimer Street, Regent Street, W., but no vehicle will be on view in England before the opening of the Crystal Palace Show, where the Syndicate will have an exhibit of these cars, together with a chassis. Special arrangements have been made for prompt delivery from that date onward.

THE VELOX CAR FOR 1903.

Some few weeks ago we gave detailed particulars of a car which the Velox Motor Co.—a new manufacturing concern lately started in Coventry—were making. During the last three months they have designed an entirely new machine from that which we described in our issue of October 4th, 1902. The chief points of the new car, which is a standard one of 14 h.p. with a four-cylinder engine, is the change speed gear of the sliding type, giving four speeds and reverse, with a direct drive on the back axle. The frame is of tubular construction on the girder principle, and the method of springing is entirely different from that of any car at present on the market.

Particular attention has been given to ground clearance, and nothing under ten inches obtains throughout the whole car. We hope to give details of the principal parts of this car, together with the necessary illustrations, in our next issue.

"The only thing that now contents me is my automobile—until I can have an airship," is attributed to King Victor Emmanuel.

THE LUBRICATION SCHEME OF THE FOUR-CYLINDER RENAULT ENGINES.

In order to avoid as far as possible the objectionable churning by the connecting rod heads of the oil in crank chambers into a species of "soap, or mayonnaise," Messrs. Renault Frères—whose excellent cars are handled in this country by the Roadway Autocar Co., of Burwood Place, Edgware Road, London—have arranged the lubrication of the frictional surfaces of their engines as shown in the accompanying diagram. The oil is delivered by the pump feed of a Dubrulle lubricator through a copper tube to the oil wells E E E formed in the

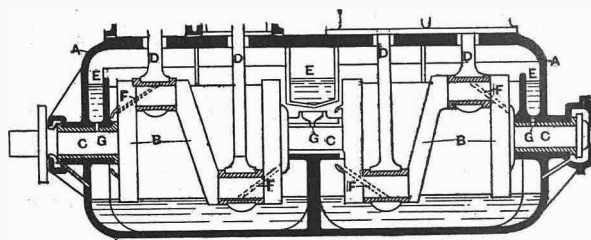


Fig. 1.—Longitudinal section of the crank chamber.

A A A, crank chamber.
B B B, crankshaft.
C C C, bearings.
D D D, connecting rods.
E E E, oil wells.
F F F, oil ways to D D D.
G G G, oil ways to C C C.

interior upper part of the crank chamber. Thence it feeds by gravity to the engineshaft bearings in the ends of the crank chamber C C C, from which a portion of it runs into the circular catch fillets formed on the outer and inner faces of the crank discs B B B. Centrifugal force serves the oil from these fillets through the passages F F F F to the crank pin bearings as shown. The surplus lubricant drops from these and the crankshaft bearings into the crank chamber, and is served thence

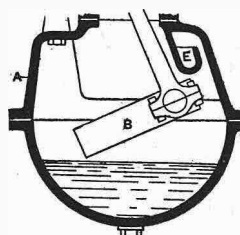


Fig. 2.—End section of the crank chamber.

on to the pistons and walls of the cylinders by the splashing from the connecting rod heads, which also throw the oil into the channel E (see end section fig. 2). Thence the lubricant attains the central oil well E (cross section), from which it drops into the cap serving the centre bearing of the crankshaft G. Thus the lubrication of the important parts of the Renault engine is not left to chance dash lubrication, but both gravity and centrifugal force are called to its aid.

A correspondent who has been spending a few days in Liverpool speaks in the very highest terms of the attention and courtesy which he received at the hands of Mr. Archibald Ford, the manager of Mr. William Lea's Motor Car Depot, 16 and 18, Berry Street, Liverpool. He stored his car at the garage of this firm; and mentions that he always had the vehicle ready to the minute it was required. The charges, both for keeping the car in order and for petrol and other necessities which were obtained, were most reasonable. We are always pleased to give publicity to such attention whenever it comes under our notice.

THE NEW NON-SKIDDING DEVICE.



Mr. Crampton's 10 h.p. Decauville, to which the antiskidder is fitted. By Mr. Crampton's side the inventor of the device is seated.

Recently we referred to a device which had been tried on different cars with great success for the prevention of side-slip. We are now able to give some more definite details. The arrangement is known as the Parsons non-skidder. As will be seen from the reproduced photographs, the device consists in its approved form—there are a number of alternative ways of obtaining somewhat similar ends—of two flexible wire hoops, one on each side of the wheel and of slightly larger diameter than the rim. The hoops are connected together by steel chains passing diagonally from one hoop to the other round the tyre. The hoop or ring on the inside of the wheel is endless, but the outer hoop is supplied with a right and left-hand screw coupling, which affords a ready means for adjusting the non-skidder to the tyre. The diameter of the hoops is such that they cannot pass over the periphery of the tyre, and we are assured they cannot come off even when it is

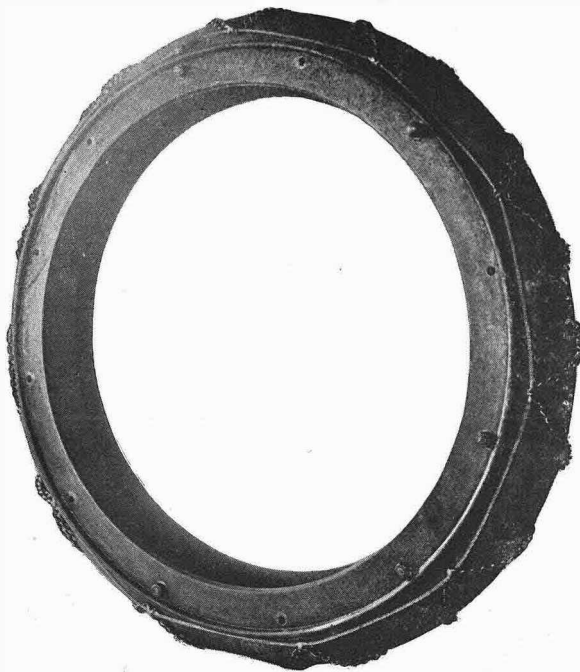
deflated. The non-skidder is not fitted tightly enough to impress the tyre visibly, and in running "creeps" slightly, so that the chains never bear on the same point of the cover at any two consecutive revolutions. Any very slight loss in efficiency from this cause is probably more than made up by the superior adhesion of the wheel and non-skidder as one. That is to say, the loss is probably far less than it would be with a plain

tyre on a greasy road; but not only so, there is the immunity from danger at good speeds, and the entire freedom from nervous stress, which can only be obtained with plain tyres by driving at a very low speed indeed, and even then, in certain conditions of road surfaces, a little slipping may take place. We are informed that some dozens of wheels have been running on different cars over long distances, and that none of the covers have shown any signs of wear from the non-skidder having been used. It will



A rear view of Mr. Crampton's car.

be seen that the arrangement can be easily fitted to any wheel without taking the car to pieces in any way, and the chains can be renewed, if desired, in sections, as each zigzag is a separate member. Side-slip is caused by the tyre failing to bite the road proper, the mud, when being in what is known as a greasy state, acting as a sort of lubricant, and presenting a film between the tyre and the road surface, so that the car has little lateral stability; and any deviation from the line of progress, whether caused by steering or by the disturbing effect of brake application, results in a side-slip more or less serious, according to the speed and general circumstances of the moment. The action of the non-skidders appears to be that they cut through the grease and get a bite upon the road itself. The arrangement was first tried upon a bicycle, and as soon as Mr. Parsons had satisfied himself that it was right he fitted it to a car, and a number of practical motorists were so thoroughly impressed with its value that a strong syndicate is being formed, in which Mr. Henry Edmunds, Mr. Paris Singer, Mr. W. J. Crampton, and other well-known members of the automobile world are interested. They have all given the non-skidders a good test, and Mr. Parsons has already had the honour of supplying a set to His Majesty the King. We have not yet had the opportunity of testing the non-skidders ourselves, but, as we have shown, they have been given a thorough trial, and there appears no doubt that side-slip has been, to all intents and purposes, overcome. It is hardly necessary to say that the arrangement is equally applicable to motor cycles, though in this case we presume that both wires are



One of the King's wheels. Goodyear tyres with non-skidders fitted.



One of the Collier-tired wheels of Mr. Edmunds's Daimler car Antrona

fitted with pipe nuts, so that the hoops can be put on and taken off without pulling the machine to pieces. We should perhaps add that it has not been found necessary to fit the chains to the front wheels. All the tests have been made with them fitted to the back only, and even when braking violently the car could be always pulled up in its straight course without slewing. At the same time, if absolute security is desired, it would probably be better to have all four wheels chained. Mr. Harry Parsons's address is the City and Suburban Electric Carriage Co., Ltd., 157a, Manor Street, Clapham Road, S.W.



Sir Thomas Lipton at the helm of his latest car, a 10 h.p. Panhard. The Hon C. S. Rolls, from whom he bought it, occupies the tonneau seat

PETROLEUM PRODUCTS. Something about Petrol or Motor Spirit.

THERE is considerable confusion as to what is the correct term for the petroleum substances employed in motor cars. This partly arises from the fact that various firms have adopted distinctive names for the particular spirit they manufacture, and these names—petrol, motor spirit, or fancy designations—are used in a general as well as in a particular sense. As a matter of fact most motor fuels, under whatever name they are sold, are, chemically speaking, approximately the same. They may vary in comparatively small details, and one kind of spirit may be more suited to a particular class of machine, but it is essential that as far as specific gravity and capability of completely vaporising at a certain temperature are concerned, the spirits should be practically identical. A petroleum product which is largely used by motorists has a specific gravity of .680 as compared with water—1. Another widely used brand has a specific gravity of .700.

The chemistry of crude petroleum embraces the chemistry of its products, of which "motor spirit" is one. Ordinary petroleum such as is used for lighting purposes, and known as paraffin, and the heavier lubricating oils are also products of crude petroleum. In fact, the substances obtained from crude petroleum cover a wide and important field.

We must go back many centuries to find the first mention of petroleum. Both Plutarch and Herodotus, as well as Pliny, speak of it. Plutarch calls it naphtha, and the wonderful fires at Baku, which were merely ignited gas or oil fountains, were worshipped as things supernatural. Another famous historian—Marco Polo—mentions it in his book, and speaks of it rather as a medicine for camels afflicted with skin diseases than as a combustible material. Various references can be found in later but still ancient works, which form satisfactory evidence that petroleum was well known many centuries before it became at all largely used. It was a thing to wonder at even as late as the middle of the eighteenth century. To-day the supply is enormous, and the wells of Baku and of Central America, besides smaller fields in other parts of the world, appear almost inexhaustible.

As it proceeds from the well, crude petroleum consists of a mixture of gases, easily volatile liquids, heavier liquids such as ordinary paraffin, and, dissolved in this mixture, solid material-like paraffin wax. All these substances are chemically related to one another, and are made up of the elements carbon and hydrogen. The difference between the gaseous portion of crude petroleum and the liquid or solid portions is simply that in the molecules or smallest possible portion of the substance the gas will have a comparatively small number of atoms joined together, and the liquid and solid portions will have considerably more.

It has been long agreed that crude petroleum is a mixture of what is known as the paraffin series of hydrocarbons. The number of carbon and hydrogen atoms varies in the different substances, but it is a recognised fact that in all the members of the paraffin series there are twice as many plus two hydrogen atoms as there are of carbon. To make it clearer, if there be twenty carbon atoms, there are forty-two hydrogen atoms. For instance, in the very simplest constituent of petroleum—marsh gas—there is one atom of carbon and four atoms of hydrogen. Some of the solid portions of crude petroleum may contain in the molecule up to seventy atoms of carbon and one hundred and forty-two of hydrogen.

The chemical properties of the various petroleum products, of which "motor spirit" is one, are very

similar. Their behaviour under certain conditions is practically the same, except that they boil at different temperatures, the boiling point rising with the increase in the number of carbon atoms in the molecule.

How Petrol is Obtained.

The various products of crude petroleum are obtained by what is known as fractional distillation. If a certain oil be required for a particular purpose, it is necessary to separate out from the crude petroleum just that portion which will exactly fulfil the conditions required. The crude petroleum is taken, and, after a certain preliminary treatment, is distilled. The low boiling portions of the liquid are given off first, and so on until the heavier oils are reached and paraffin wax is left in the retort. The particular oil required is given off at a certain period in the course of distillation, and can be secured and so separated from the other products. To obtain a purer article still, this separated oil is distilled again, and it is partly to this fact that motorists must look for the reason why "motor spirit" is expensive in comparison with other crude petroleum products such as common benzoline. It is essential for motor purposes that the oil should have the correct specific gravity, and that it should evaporate at the right temperature and leave no residue.

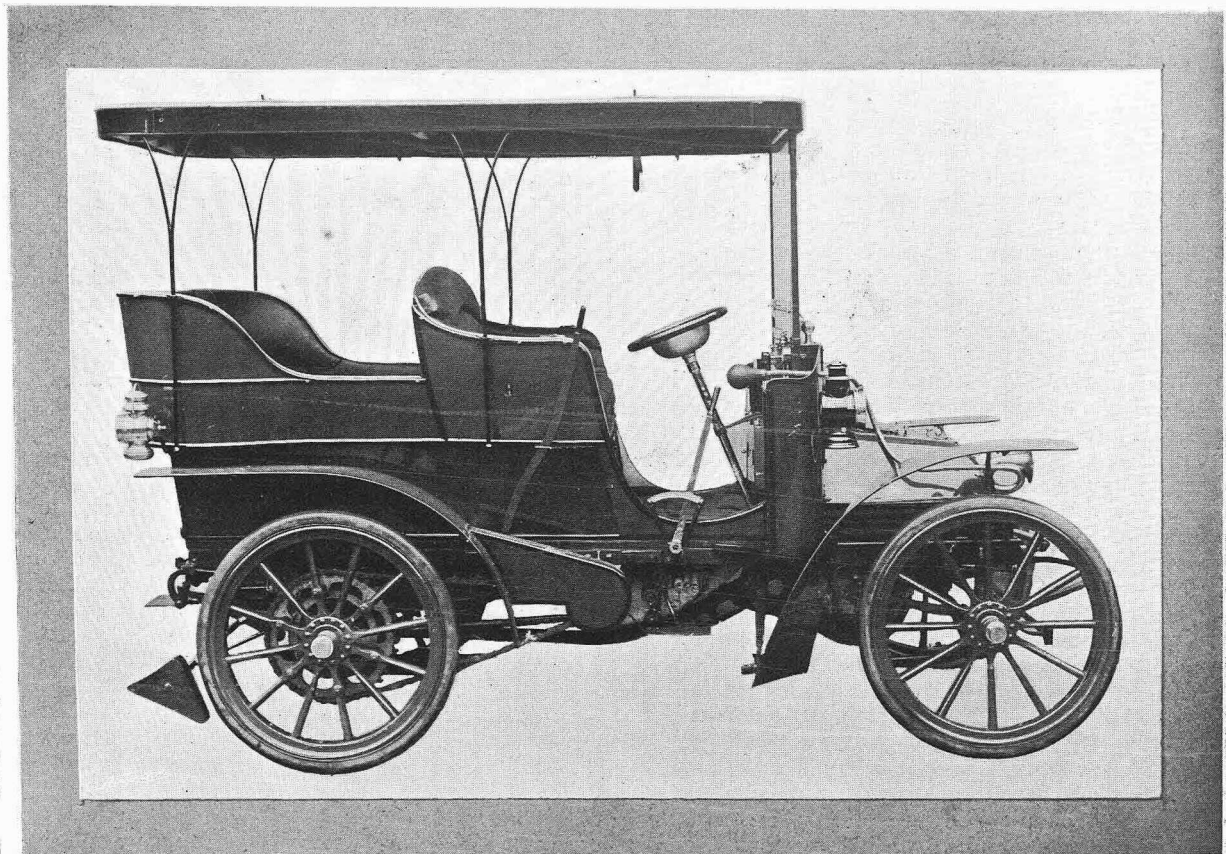
The problem of the origin of crude petroleum is a most interesting one, and still awaits conclusive solution. One school of scientific thought holds that petroleum is the result of contact in the interior of the earth between water and molten metallic carbides. The water is supposed to percolate through the earth till it reaches the molten carbides, and to be formed into petroleum as the result of the reaction. This resembles the method by which acetylene gas is manufactured from calcium carbide with water. Another school of chemists holds that petroleum is the result of the decomposition of organic material. The fact that petroleum is found in almost all geological formations favours this theory, but this school of thought is divided against itself upon the question as to whether the organic material from which petroleum is said to be derived is of marine animal origin, or of vegetable origin.

Whichever of these theories is correct, the conditions favourable for the natural storing of the oil seem to be the same whatever the quality and general surroundings. The oil is absorbed by porous rock, which is protected by a covering of hard rock from oxidation and displacement by water. The cause of a "gush" of oil is variously explained. The weight of overlying strata is some-

times said to force the oil up through the well, or this may be effected by the pressure of accumulated gases, or by water pressure. The pressure in either case must be enormous. The oil is sometimes flung to a tremendous height, and the pressure is maintained for a lengthened period. A recent "gusher" in Texas, for instance, was said to have a capacity of 200,000 gallons of oil per day, and a still greater stream is recorded of two of the Baku fountains, which each flung into the air with tremendous force nearly 30,000,000 gallons of oil in a month. It is needless to enlarge upon such facts as these to show the extent of the pressure which is exerted from some cause around the petroleum deposit.

As a source of energy, petroleum would appear to have a great future before it, and yet we are not certain that the supply of petroleum is inexhaustible. The contingency of the supply failing

must always be reckoned with. Especially is this the case, as the origin of petroleum is an unsettled point; and, consequently, we are uncertain as to whether the supply of petroleum is or is not being continually replenished. Even a reduction in the amount of the present generous supply would make a difference in the price, and so affect the position of petroleum in the competition with other sources of energy such as coal and the power of wind and water. But apart from such a catastrophe it is safe to say that petroleum will always play a large part in the supply of mechanical energy for the world. It has many advantages over coal. It is readily portable, comparatively clean, efficient, and in many cases more economical; and it should one day become rare, motorists will be able to fall back on alcohol as fuel for their engines, or—and this is perhaps more within the horizon of the probable—alcohol may supersede petrol.



The 12 h.p. Brooke 1903 car. It is fitted with the Brooke standard three-cylinder engine; the cylinder bore is $3\frac{1}{2}$ in. and stroke $4\frac{1}{2}$ in., the normal speed being 900 r.p.m. The change speed gear giving three speeds and reverse is worked entirely by chains. The vehicle has a wheelbase of 7ft. 3 in. and gauge of 4ft. 6 in., the wheels being equal sizes—34 in. in diameter. The weight is 19 cwt. complete.

The automobile seemed to be master of the situation at the recent election at Newmarket. Voters scorned horsed vehicles, and insisted on being taken to the poll in motor cars—no matter whose—about fifty of which were in use running at high speeds, for the police were indulgent. The petrol famine poured oil on political cantankerous-

ness, and rival parties lent each other the requisite liquid or a charge of carbide in the true spirit of motor brotherhood. The Liberal candidate utilised his car for visiting all the polling stations in the constituency—a tour of about 130 miles. For such an ultra-horsey electorate this is a distinct sign of the times.

A CURIOUS FEATURE OF ELECTRIC IGNITION.

For about a year past the workmen whose duty it is to test the engines in Messrs. Panhard and Levassor's works have been in the habit of arranging the high tension wires which are usually attached to the ends of the sparking plugs in such a way as to set the end of the wire about one or two millimetres from, but not attached to the outer end of the conductor wire of the plug. The men found that this arrangement afforded them two advantages. In the first place, they are able to see if the current is passing properly to the plug; and in the second they benefit by the interesting and hitherto unexplained fact that when the current passes to the plug, as already explained, the spark jumps the interval between the platinum points within the cylinder, however much the same may be covered with oil. As new motors under test are, for obvious reasons, very liberally lubricated, this strange freak on the part of the electric current saves the testers much delay and annoyance.

It was quite by chance that the above little electric eccentricity was discovered. Messrs. Panhard and Levassor conceived the idea of protecting the exposed ends of sparking plugs by means of an ebonite cap A (fig. 1). In the under dome of the cap was fitted a metallic boss B, the cap itself being

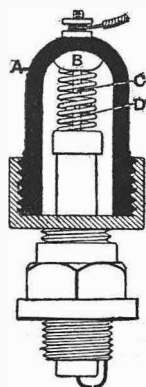


Fig. 1.

A, vulcanite cap.
B, contact boss.
C and D, metallic points between the plug and B.

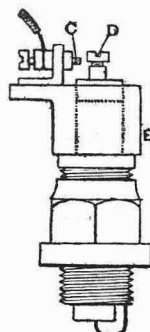


Fig. 2.

C, screw part of terminal.
D, head of insulated pin in the plug.
E, vulcanite collar.

attached to the sparking plug as shown. A light copper spring connected the boss B with the end of the plug for the conduct of the current. One day, upon taking off one of these ebonite caps, it was found that the copper spring conductor was absent between C and D, but, notwithstanding the cylinder to which the apparently faulty plug was fitted, fired perfectly. This was not particularly remarked at the time, as the spark given off by the coil at atmospheric pressure was something like 15 mm. in length, and the distance it was required to leap by the absence of the conducting spring was not more than 3 mm. But what did astonish was the fact that no matter how much the particular sparking plug served by this apparently faulty connection was drowned in oil, it sparked as well as, if not better than, ever. Our confrère M. Baudry de Saunier, whose remarks on this subject in his interesting paper *La Locomotion* we are somewhat freely translating, relates how this curious feature

was demonstrated to him at the time by a complete connection being made to the oil-soaked plug, when it altogether failed to spark, but recommenced to do so merrily when the connection was again interrupted in the manner we have indicated, and the spark obliged to jump once more within the ebonite cap.



Fig. 3. — Plan of Fig. 2.

We leave, says M. Baudry de Saunier, the explanation of this phenomenon to the profound electricians, and he goes on to show his readers, as we now show ours, how they may adapt their plugs to permit of the oil-defying jumping spark. Reference to fig. 2 will demonstrate this; E is a shaped collar made in ebonite, or better in some substance which is at one and the same time a non-conductor of both heat and electricity. This collar is screwed on to the plug as shown. It carries on its little projecting arm a small copper angle piece drilled and tapped for the attachment by a screw C and lock-nuts of the secondary wire. The end of the screw is made to approach the end of the plug wire within one or two millimetres. To arrive at the sparking points on the cylinder end of the plug the current is obliged to leap the little gap of one or two millimetres which exists between C and D. This mounting of the plug, says M. de Saunier in conclusion, not only increases the power of the engine, but, as has already been stated, causes the plug to spark properly within *malgré* any amount of over-lubrication of the cylinder.

THE CRYSTAL PALACE SHOW.

We have received No. 3 of the *Automobile Show Gazette*, a four-page production edited by Mr. F. W. Baily, the manager of the exhibition, and giving some interesting particulars of the great show which will open on January 30th and close on the following Saturday week, February 7th. It appears already that nearly 78,000 square feet of space have been booked, and that the frontages of the stands will total about three and a half miles. Mr. Baily informs us that he has made a comparative measurement of the Crystal Palace floor area with that of the Grand Palais devoted to the recent Paris exhibition, and he finds that, roughly, the ground floor of the Crystal Palace is twice the size, and he incidentally mentions that every bit of it is let. This, we take it, does not include the gallery and outlying portions of the French exhibition; but in any case the English show will have a great advantage, inasmuch as the whole exhibition will be upon the one floor. The exhibition will be an international one in every sense of the word, as, apart from a very large percentage of the British firms, the great French and German houses, as well as the American, will be either directly or indirectly represented. There appears to be no doubt the exhibition will be the largest ever held in this country devoted to motors, and it would appear that it will actually be the largest in the world up to date. At the present rate of development, it will be necessary another year to restrict the area of each exhibitor very materially if all are to be included, and we understand that some firms have already booked space for 1904.

CONTINENTAL NOTES AND NEWS.

Paris Show Awards.

As a means of encouraging makers to exercise taste in the arrangement of their stands and the design and finish of their vehicles, the committee of the Paris Salon offered a number of awards for the most attractive exhibits; and it was doubtless largely due to this incentive that the display was of a much more artistic character than on any previous occasion. So general was the merit of the stands that it must have been difficult to make a distinction where exhibitors had all done their best, and this accounts for the large number of medals and diplomas that were distributed. For the stands gold medals were given by the Municipal Council of Paris, the Automobile Club, and the trade syndicates. These were awarded respectively to De Dion-Bouton et Cie., Clément et Cie., Panhard et Levassor, and Darracq et Cie., and upwards of fifty firms secured silver and bronze medals. For elegance in carriage design, Charron, Girardot, et Voigt obtained the prize of the A.C.F. with gold medal, the Société Mors the prize of the Chambre Syndicale de l'Automobile with gold medal, Panhard et Levassor the prize of the Executive Committee with gold medal; and gold medals were awarded to De Dion-Bouton et Cie., Delahaye, Société Parisienne, Renault Frères, Daimler Motoren Gesellschaft, Gobron-Brillié et Cie., Pipe, the Wolseley Tool and Motor Car Co., Napier and Son, Georges Richard, Rochet-Schneider, De Dietrich, and Peugeot. Twenty-six other firms received silver and bronze medals. In the steam section, a *diploma d'honneur* was awarded to Gardner-Serpollet.

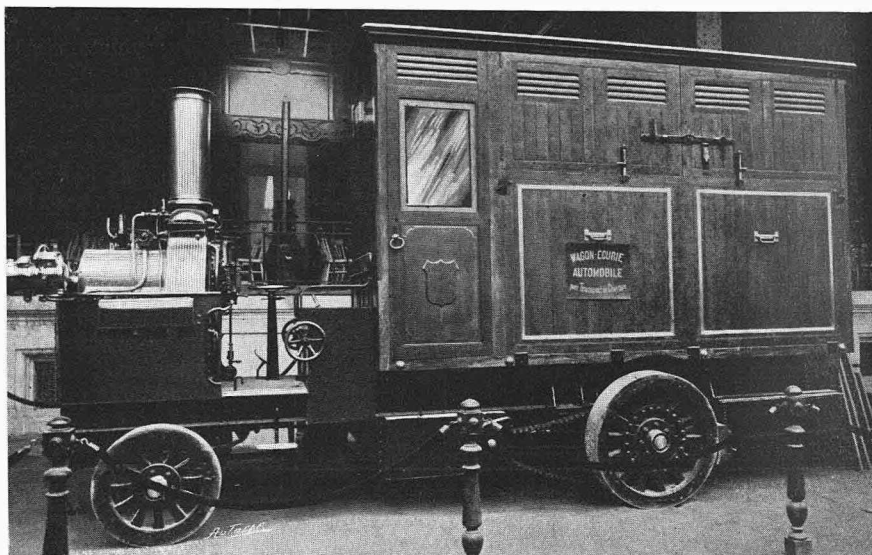
Trials of Silencers.

Having improved the petrol motor to the extent that the noise and vibration are practically suppressed, attention is being given now to the silencer, which it is to be feared has been a somewhat neglected feature of the autocar. The Automobile Club de France accordingly has decided to organise a trial of silencers, which will begin on March 1st at the laboratory of the club at Levallois-Perret. The conditions imposed on competitors are that each silencer must be accompanied with a drawing clearly showing its internal construction, and that each apparatus must be supplied with a particular form of connection which will allow of its being fitted to the one motor that will be used for testing all the silencers presented. This is a single-cylinder engine with a bore of 140 mm. and a stroke of 160 mm., and running at from 1,600 to 2,000 revolutions a minute. A first prize of a thousand francs, offered by M. Darracq, will be

awarded for the most satisfactory apparatus, and medals and diplomas will be given either for the complete apparatus or for improvements in detail.

Automobile Club of Spain.

The first result of the forthcoming Paris-Madrid race has been the creation of a Royal Automobile Club of Spain, under the patronage of H.R.H. Don Alphonse XIII., who has also accepted the title of honorary president. Duc de Santo Mauro is president of the new club, and the other officers are: Marquis de la Mina and Count de Valdelangrana, vice-presidents; Marquis de Viana and Marquis de Valdefuentes, secretaries; Senor Luis de Bermejillo, treasurer; and Senors Quinones de Léon and Luis Errazu, delegates of the club in Paris. A sports commission has also been appointed, under the presidency of His Excellency Duc de Arion. The first task to be undertaken by the committee, of course, is the organisation of the forthcoming race, which appears to be making very satisfactory pro-



The Turgan-Foy horse van shown in the Salon.

gress, and three different routes from the frontier to the Spanish capital have been mapped out for investigation. The total distances by these different roads vary from 745 miles to 870 miles.

THE CLEMENT 9 AND 11 H.P. ENGINES.

Several enquiries have been made of us of late with regard to the actual difference between the 9 h.p. and the 11 h.p. Clément engines, suggestions having been made in one or two cases that there was no difference between them. We have ascertained, therefore, from Mr. D. M. Weigel, the managing director of the British Automobile Commercial Syndicate, the actual dimensions of the two engines. He informs us that the dimensions of the cylinders of the smaller powered engine are: Bore 75 mm. = 2.952 in., stroke 120 mm. = 4.724 in.; while the bore of the cylinders of the higher powered engine is 85 mm. = 3.346 in., and stroke 120 mm. = 4.724 in.

Correspondence.

THE BALANCING OF ENGINES.

[2750].—Mr. Inglis appears to lay much more stress on the fore and aft balance of an engine than is necessary, and his letter would lead one to suppose that this is the most important point in the whole of the balance of a motor; but such is not the case.

The balance of reciprocating parts is the vital point, and with the three-cylinder motor this is done to a nicety when the cranks are set to 240°.

Again, the turning moment in a three-cylinder motor is so much better than in a two-cylinder that this alone would be sufficient to give it the position you do in your leading article on three-cylinder motors.

MAWDSLEY BROOKE.

MOTOR CAR INSURANCES.

[2751].—Can anyone tell me which is the best and cheapest office for third party indemnity insurance (not including passengers in the cars), and what arrangement they would make for anyone in the trade who lets out cars for hire by the day, etc., to private persons—to cover, say, three cars? It must be understood that the cars do not "ply" for hire, which should be taken into account.

To what extent is one who lets out cars in this way responsible for damage to passengers in the car?

A. B. C.

THE NUMBERING PROPOSALS.

[2752].—Will you allow me to make a correction in your report of the general annual meeting of the Lincolnshire Automobile Club in your issue of Dec. 20th. Mr. Rasdall writes disclaiming ever having suggested that "motors should be numbered like cabmen and policemen." I, of course, was present, and did not hear any such remark. The president did not say that "every time he went out he had to break a stupid law."

The motion against supporting the legislation proposals in Parliament was carried by about a two-thirds majority of those voting, one-third of those present not voting either way, the president, Sir Hickman Bacon, stating that he dissented from the vote.

I regret that the Christmas holidays have prevented me seeing the mistake before and so writing to you earlier.

EDWARD CRAGG (hon. secretary).

[2753].—Apparently a large proportion of automobilists are opposed to the numbering of cars. Cannot we, therefore, while there is yet time, send petitions against the proposal to the committee of the A.C.G.B. and I.; and in place of numbering, advocate the more efficient French system, which requires all drivers to pass an examination and hold a certificate of competency?

I shall be pleased to do what I can in this district to that end; but, of course, there should be general action over Great Britain. Let us remember how the cyclists acted under similar circumstances, and also the success they obtained in avoiding numbering.

C. E. ABBOTT.

PARAFFIN BURNERS FOR STEAM CARS.

[2754].—Having had a Clarkson burner fitted to my steam car, I was interested in reading Mr. E. Mouey's letter in *The Autocar* of January 3rd, and can confirm what he has experienced in the irregular working of the burner.

The main reason for this is that after some days' use a carbonaceous deposit forms in the vaporising coil and at the entrance to the needle valve. This difficulty can be remedied by fixing a steam connection to the oil supply tube and blowing steam through the burner when it shows signs of working badly.

Despite the other defects that your correspondent mentions, and which the makers will doubtless rectify in time, the non-success of the Clarkson burner lies not so much in the burner itself as in the fact that it has been fitted to cars not designed for this type of burner.

In most of the light steamers the driving chain runs close under the centre of the firebox, and so if a Clarkson burner has to be fitted it must be placed at one side. Consequently, nearly one-half the boiler tubes get little or no heat, whilst the other tubes have more flame than they can take. Again, these small tubular boilers are not suitable for a single concentrated flame, and will never make steam as quickly with this type of burner as with the equally distributed flames from the petrol type of burner. With flash boilers it is just the reverse.

As insufficient steam makes the running of a steam car a toil rather than a pleasure, and as from motives of safety and economy most of us would prefer paraffin to petrol, it would be most interesting to have the experiences of readers who have tried other makes of paraffin burners.

PRACTICAL.

[2755].—In reply to No. 2747, which appeared in your issue of January 3rd, kindly allow me to say a letter of mine appeared in your valuable paper about two years ago giving my experience of the burner mentioned and also burners of like construction, in which I pointed out that said burners worked well for a short time, but soon choked the tubes with black soot or a thick brown dust. Either of these deposits is well known to be detrimental to good steaming in any type of boiler. Perhaps the firms making steam cars mentioned by your correspondent could give a very good reason why they do not fit paraffin oil burners to their cars, as the running cost of a car using a good paraffin burner is one-third less than the same car using petrol. For the information of your correspondent, the best one I know is of British manufacture. Some cars for sale fitted with paraffin burners, etc., are often those which have been made useless for the time being by persons who know little or nothing about their construction tampering with them. Here is a case in point: A cycle maker had a boiler to repair. When done, it was tested to 5 lbs. water pressure. Of course, it did not leak at that pressure. It was replaced in the car. Steam was got up, and the fire was extinguished, because the boiler leaked worse than before. It was repaired. The consequence was the boiler had to be re-tubed at a considerable cost and loss of time to its owner. This caused him to sell the car in disgust at about half the price it cost him when new. The same car is in good running order to-day in the new owner's hands.

H. BROUGH.

AN ANTI-SKIDDER.

[2756].—Mr. H. B. Haines, in the *Horseless Age*, December 17th, recalls an old device that many of us no doubt have used with iron-tired transport over slippery frozen ground, namely, winding a piece of rope spirally over the rim and tyre between the spokes. It is a cheap and very effective method, harmless even to rubber tyres, and free to all, because not patentable.

C. C. LONGBRIDGE.

AN UNBURSTABLE TYRE.

[2757].—The letter of the Collier Tyre Co. in your last issue replying to mine in your issue of December 27th is very amusing. It indicates a strange, but not unprecedented, incapacity to grasp a novel fact readily, however clearly stated, even after the matter has been supposed to have been carefully considered. Hitherto, as the writer implies, when the cover burst, the result has been a burst tyre, because the air tube necessarily burst with the cover, so that the tyre deflated and failed. But with my new air tube, as I clearly explained, the cover may burst, and yet the result need not be a burst tyre, but only a tyre with a burst cover, because my new air tube will itself restrain the compressed air, and maintain the efficiency of the tyre till it can be conveniently repaired. At the same time, the tubes have all the properties of ordinary tubes, and are approximately of the same weight. Should the Collier Tyre Co. have any real doubt as to these facts, I shall be pleased to demonstrate the properties of my tubes to them, if they will make an appointment with me for the purpose; but these properties will be publicly demonstrated at the approaching shows. I think it well at once to reply to the Collier Co.'s letter, lest meantime any other of your readers should misunderstand the case, as they appear to do.

M. D. RUCKER.

THE RELIABILITY TRIALS.

[2758].—I note Mr. A. E. Cohen's reply to my letter *re* Locomobile, and beg to point out to Mr. Cohen that, on the question of brakes, he entirely misses the points at issue, which are simply these:

(1.) The Light Locomotives Act requires all cars used in this country to be fitted with two independent brakes. Now, the Locomobile, and, according to Mr. Cohen's letter, the Weston cars also, are only fitted with one brake; and, therefore, anyone using in this country either of these cars, as sent out by the makers, is breaking the law and rendering himself liable to a heavy penalty.

(2.) I contended that (setting the law aside), for safety alone, two brakes are necessary on all cars. I quite agree with Mr. Cohen that on steam cars the engine may be used as a brake; but as its retarding action when so used has to be transmitted through both the chain and differential gear, it cannot, in any sense, be looked upon as an emergency brake, as, were the chain to break or come off (as these chains are liable to do at times, especially when sudden strains, such as reversing the engine in an emergency, are thrown upon them), the engine braking would be quite useless. Also, were anything to go wrong in the differential gear, both the engine braking and the present band brake on differential would fail to act, and the car would be entirely incapable of being brought to a standstill. There are probably no parts of a car subjected to greater strains than the differential gear and the axle ends adjoining it; and no matter how good the materials and workmanship in it may be, there is always a chance of its failing; and when this happens, the differential box simply slips round on the axle; and I think this fact proves beyond all doubt that any car whose sole braking power is dependent on the differential gear, as in the case of the Locomobile and Weston, is not a safe machine to put into the hands of the public.

With regard to the other matters mentioned by Mr. Cohen, I find, on consulting the Weston 1902 catalogue, to which Mr. Cohen refers, that the Klinger gauge is an extra on all their models, and mudguards extra on all models but one. I further notice from the Weston catalogue that condensers are extra on all their cars, although, owing to the visible vapour given off from the exhaust, it is illegal to use a steam car without condenser in this country.

To sum up: If I buy a petrol car, I get a complete machine ready for the road; but when I buy a Locomobile or Weston, I must pay extra, not only for mudguards, but also for a condenser and an extra brake, without which fittings it is illegal for me to use my car; and even then the extra brake is only a tyre brake—a mere "makeshift," nothing like so efficient as the band brakes now universally fitted on the driving wheel hubs of all first-class modern cars.

Condensers and extra brakes are absolutely necessary in order to comply with the law, and cannot be looked upon as accessories; and I think the Locomobile and Weston Co.'s would do well to fit all their cars in future with condensers and extra band brakes on driving wheel hubs. Indeed, until they do so, their cars can neither be looked upon as complying with the law, as safe to use, nor yet as being fitted up in accordance with the practice of the best makers of to-day.

PRACTICAL.

[2759].—I can fully endorse "Practical's" remarks in your last issue *re* the Locomobile. For a long time I had qualms about driving a car fitted with only one brake, especially in Kent, where it is pretty hilly; and an incident I lately experienced proved that my fears were not groundless. While driving through a thickly-populated town, I had occasion to use my brake rather suddenly, with the result that the leather was completely stripped off the band. Unaware of the mishap, I continued my way in ignorant bliss till I began to descend Friday Hill. Erith (well known I have no doubt to many of your readers on account of the sharp bend at the bottom), when, on the brake naturally failing to act, the car got beyond control, and it was only by the purest luck that I got round the corner safely. Had there been any traffic about at the time, a smash-up would have been inevitable. Since then I have drilled the rivet holes in the steel band about

3-32in. larger, and have employed thicker leather; and although I have several times put the brake to severe tests, it has never shown any tendency to strip. Braking with the engine I avoid as much as possible, for if indulged in at all suddenly, it usually results in a broken chain, to say nothing of the detrimental effect upon the engine due to the sudden shock. If I might venture, I should like to make a couple of additions to "Practical's" list of improvements. One is the fixing of a small electric lamp of the "ever ready" type about an inch or so in front of the gauge glass, and worked by a button fitted in close proximity to the throttle handle. I have tried the experiment, and find that it has a decided advantage over the cycle lamp, which has a nasty habit of blowing out whenever there is the least suspicion of wind. My other addition is the fitting of a stouter chain. Beyond the braking difficulty, I have always found the Locomobile to be a thoroughly reliable little car.

STANLEY RAWDON.

A RACING MAN'S VIEW OF THE PARIS EXHIBITION.

[2760].—It is generally granted that grave obstacles surround British motor manufacturers if they are to regain lost ground and overtake, let alone outstrip, our Continental rivals. It is not my purpose to write here of these obstacles, but so grave and growing a *danger* has made its appearance lately that I feel no great apology is required for drawing straightforward attention to it.

May two comparisons be permitted? In yacht racing it is found that the racing man is competent (or the only one competent) to deal with such matters as shape of keel or lines of hull? How many racing skippers are able to say beforehand that such and such a change in matters of this kind will produce such and such results? Will our yachtsmen, who are also motor car owners, tell us? Now for the other comparison, which has more affinity to my point: Bicycle racing to motor car racing may be a far cry, but they are both within the ken of road locomotion, and this will have more point when one calls to mind that the majority, and included in that majority most of the leading exponents of motor car racing men, received their early training as bicycle racers.

The question led up to is: How many bicycle racers are or have been able to advise makers beforehand as to what (or what not) will be an advance in construction? A long and varied experience in this case enables me to answer with confidence the question myself. No advice or help, with a few rare exceptions, has ever been given, and it is notorious that racing cyclists as a whole know so little of their machines as to make the subject one of ridicule. That *the bicycle was evolved for the racing man by the maker and not vice versa* is as sure as most things.

In a letter which recently appeared in your pages Mr. Chas. Jarrott, on his return from the Paris motor show, writes as a racing man of "The lessons to be learnt," etc., but on careful perusal it is not evident what those lessons are, unless it be that manufacturers and agents, or, rather agents and manufacturers, are admonished to "pull together." The rest of the article consists mainly of cheap sneers at certain phases of construction, which are identified with the Mercedes design, and an expression of self-satisfaction of British manufactures as they appear to-day against Continental, and in these expressions, coming from such an eminent authority, and backed up as they have been by many of the British technical journals, lies the danger of which I crave your readers' permission to comment on as a mere manufacturer whose whole and sole interest is in the sale of English cars, and whose interests do not mainly consist in the exploitation of Continental manufactures and the earning of an occasional commission on the sale of an English car here and there.

It is my purpose, within the narrow scope of this letter, to endeavour to show that some of our British papers are unwittingly injuring the British manufacturers by allowing them to believe that we are occupying a position in motor manufacture which we do not occupy, and that in some cases are possibly being deliberately misled by people who should know better, or who are not the experts they would have us believe. The British visitors to the Paris Exhibition were many, and a very great proportion of them consisted of gentlemen neither motor agents nor motor manufacturers, but who as a class are most competent to judge

of the issue which I have ventured to raise—men at the head of important and varied British industries, men who are just as keen on Britain holding her proper place in the motor industry of the world as anyone at home directly interested in the motor trade—and to such I make my appeal, and without further ado ask what does it mean when Mr. Jarrott writes for the benefit of those people who are compelled to stay at home, that "All the French makers are being lured on in the direction of complications. . . because of the Mercedes"? Can it mean that his advice to British makers is "be careful that you do not do likewise"? One would have no justification whatever in assuming for one instant that the advice was not other than entirely disinterested, but one may claim the right to enquire whether at least the advice is sound. Let us do so.

The outstanding features of the Mercedes copied by the leading French makers, and none are so high or mighty as not to have copied, are, roughly speaking, three in number:

- (1) The *chassis embouti* (pressed steel undercarriage of channel section).
- (2) Mechanically-operated inlet valves.
- (3) Multi-tubular radiator of special design and construction.

As to (1), the new steel frames, notwithstanding Mr. Jarrott's opinion, are a very great advance indeed on the old L section iron and wood frames. They are lighter, stronger, and when sufficient quantities have been produced out of the tools for making them to cover the cost of those tools will be greatly cheaper than the old style.

(2) Mechanically-operated inlet valves are discounted—it is not clear why, unless it is argued that they are more complicated. Are they? Making a comparison between them and the valves worked by suction there is still only one valve, one spring, one washer, and one cotter. The only possible disadvantage (?) is the adding of a cam to a shaft which is already in existence, so that by mechanical operation it is possible to get a positive time of opening and a positive time of closing, irrespective and independently of any of the conditions which may cause the induction valve by suction to vary its work from time to time, and when over and above this advantage the means to run an engine extremely slowly without bringing it to a standstill is added, is it difficult to find a reason for changing?

(3) The Mercedes type of radiator, or something similar, and which is not at present generally fitted in this country, is more efficient than the radiators which we are still requested to adhere to by our friends. The proof as to whether this advice is sound is a short one. No radiator ordinarily fitted in this country will keep the water cool enough so that a car does not require refilling for, say, 500 miles, whereas it is claimed that the other type of Continental radiator will do very much better than this, but any way, it will be readily granted by everyone that the last mentioned is at least as efficient as the other, and there is no argument about the one fact that it does not require a great water tank somewhere at the back of the car with all its attendant complication of pipes to and from; moreover, such a tank and its contents are very heavy, while the Mercedes radiator requires no separate tank, being in itself tank and radiator combined.

The one other point as I understand it in the lessons which we are to learn is that in *simplicity we can be taught nothing*, and comparison is made between a certain car and French makes. I must deny myself the doubtful privilege of criticising that comparison. Mr. Jarrott must have been very deaf if he did not hear some of the many remarks passed both in the exhibition and at hotels by our own countrymen, and I leave it for those visitors to say whether the comparison had better have been made or not. On the score of simplicity we have many leaves to take from our Continental competitors' books: the care and thought which have been taken to get from here to there in the shortest and straightest manner are nothing short of amazing, and it is sheer folly to blind our eyes to the facts.

I am conscious that in approaching this matter I am performing a thankless, though self-imposed, task, and I expect to be greeted from certain quarters with howls of derision, but all the same I am encouraged to go on in the belief that the purchase of British motor cars depends so much on broad-minded intelligence, and so little on narrow-minded prejudice, that there is more prospect of the British aristocracy and the British upper classes being weaned from cars of foreign manufacture if they become conscious that there is at least a section of British makers who are alive

to our shortcomings and who are willing to learn from those who can teach, and to copy if need be from those who at present lead, instead of feeling all the time that by supporting home industries they are being called upon to put up with the defects which may, and at the present time do, exist through drawing our cloak of insular exclusiveness around us, and falling into the good old British error of holding our enemy too cheaply, and I say, although I can hear already the rush of the storm which I am gathering about my head, that it would be a kinder and a sounder policy for our British technical journals to realise the situation and convey the facts to the British manufacturer. It is all nonsense to argue from a visit to the recent Paris Exhibition that we are regaining lost ground; it was only too painfully evident that we are doing nothing of the kind, and that we are farther behind than ever.

One personal explanation is necessary before I close. I am sure to be accused of—how shall I put it, or may I write it?—well, "as calling stinking fish," especially as I am interested in the sale and manufacture of an English car, the name of which it is not necessary to mention here. No claim has ever been made for that car that it is perfection, and no claim is now made that that car at present embodies in its construction the technical points which have been touched upon above; but I say that after deliberation I am determined to avail myself of some of those improvements which I saw at the Paris show, and, viewed as a competitive British manufacturer, improvements which are really advances, notwithstanding what Mr. Jarrott says; and while at first blush it may seem more advantageous for my firm to attempt to steal a march on our fellow British makers, I think for the good of our motor industry it is more honourable, and more wise, to straightforwardly express my views and convictions than to join in the attempts which are being made to mislead home makers—attempts by persons whose interests are only partially, and in some cases very partially, in cars of English manufacture. It seems to me that the future of my company will be better assured by a strong British industry well rooted in all towns and cities suited for manufacture than by the individual glorification of one or two isolated firms and individuals. The more strong British makers there are the sooner we shall take the place we covet. Surely that position will not be obtained by an ostrich-like policy on the part of the makers, or by the "wish farther to the thought" style so evident in the writings of our many and able technical journalists, or by both of the groups named being led by the nose by people who have many and varied foreign interests to conserve.

CHAS. SANGSTER.

COUNTY COUNCILS AND HIGHWAYS.

[2761.]—I have been much interested in Mr. Williamson's criticism of my paper abstract upon the above subject which you were good enough to publish in your issue of December 27th.

Mr. Williamson's leading points may, I think, be summarised as follow:

(a) A repudiation of my assertion that roads unfit for a traction engine are alike unfit either for a bicycle or a motor car; statements (b) that he can speak personally of the great damage to main roads by the use of traction engines; (c) that whereas during the past ten or fifteen years the steam-roller has been a beneficent agent, the traction engine has been a devastating one; and (d) that the motor car (by which I presume he means the weight-carrying road motor) is the tractive appliance from which he anticipates the most satisfactory results in the future; with, finally, an inquiry (e) as to where the money is to come from to bring up British roads to traction engine standard; and a somewhat sweeping suggestion (f) as to "Government mercenaries" alike ignorant of macadam roads and of the traction engines which traverse them.

Perhaps, therefore, you will allow me to deal very cursorily with these five topics in the order given.

(a) Mr. Williamson need scarcely be reminded that the best road surface is that which offers the least resistance to tractive effort; that effort, whether animal or mechanical, is not obtainable out of nothing; and that the excess of power absorbed in the negotiation of rotten roads is not only unremunerative but destructive, whether it refer to a wheelbarrow or to a locomotive. The comparative efficiency of any two highway sections of similar contour

is, of course, the difference of the tractive efforts expended in the moving over their respective surfaces of two coincident loads at corresponding speeds. Where, for example, in the vicinity of large towns the road surfaces are fairly good, the net average working load of a draught horse is 20 cwt. to 25 cwt. But where in rural districts the surfaces are yielding and the gradients heavy, the load only averages 10 cwt. to 15 cwt. This difference, therefore, signifies a dead loss involved by the perpetuation of bad roads. As a cyclist also, Mr. Williamson knows perfectly the difference between pedalling up a hard resilient gradient of, say, one in fifteen, and at the same speed a similar one with a sticky surface. And in the case whether of a motor car or a traction engine under like conditions, there must either be a development of extra power or a slowing up by change-speed gear to provide for this. Hence the road surface which in an engineering sense is efficient for one class of wheeled vehicle is within certain limits equally efficient for the other.

(b) I do not think it will be impossible to convince Mr. Williamson that a traction engine will do less damage for the same volume of traffic on any fairly honest macadam highway than a two-wheeled cart. And if he cares to put this to the test, I guess I know of steam tractor owners who would afford liberal facilities for the experiment. Doubtless, a traction engine will search out scamped bits—too often at the cost of broken gearing and axles—but is that not a virtue rather than a crime? I have clearly in my mind a hundred yards strip of accommodation road, consisting merely of an improvised macadam track raised about a foot over the surrounding land level, and with no foundation whatever. On this I have many times witnessed the comparative effects between horse and traction engine drawn traffic. I have seen its surface cut almost into ribbons after one or two hundred tons of cartage during bad weather. And I have also seen its surface rolled almost like a board after three or four hundred tons of steam haulage under like atmospheric conditions. I am prepared to show it to Mr. Williamson, for it has proved to me that the absence of foundation (unless in the case of roads overlying quicksand or moss) is infinitely less serious than the absence of thorough surface and subsoil drainage, which in severe winters plays more havoc with roads than many people would credit. Water, in fact, in suspension either within or directly below the road crust is incalculably destructive in all weathers.

(c) Is it not rather hard that the traction engine as a steam roller is to be praised while its road haulage counterpart is to be condemned? It cannot be denied that there are objectionable details in the construction of road locomotives. But they are not irremediable, and Mr. Williamson need only refer to the several Highways and Locomotives Acts to discover the reason of their existence. It is simply a case of the British legislator knowing better than the British engineer. The terrible mistake, however, which Mr. Williamson and so many of his highway confreres make is the treating of roads as if they were bridges. For a bridge is essentially a suspended structure, made only to carry definite total loads, whereas a highway is (or ought to be) a solid mass constructed to carry definite working loads *per inch of wheel breadth*. At the same time I should be glad if Mr. Williamson could point out to me any one single main road in Great Britain definitely engineered for any working load whatever, whether total or per wheel-breadth inch. For that British highways have no working standards of any kind is one of the chief grievances of those interested in mechanical road transit. The general use, however, on Northumbrian roads of 15 to 18 ton steam-rollers is an implied proof that these roads, at all events, are, in the opinion of their administrators, equal to the support of considerable dead weights; besides which the Northumberland County Council byelaws regulating wheel breadths for horse-drawn traffic demonstrate precisely the same thing. They sanction, for example, the conveyance of 10 ton gross loads on waggons having four 8 in. wide wheels. Would, therefore, my opponent, as a road conservator, prefer such waggons being drawn by long teams of horses rather than by traction engines? I suggest, at all events, that Mr. Williamson take time to consider before he commits himself to an affirmative reply.

(d) I am afraid Mr. Williamson writes either not as a practical engineer, or that in longing for the suppression of the traction engine by the advent of the self-contained weight carrying motor vehicle he had something in view essentially different from the existing motor lorry. The motor lorry and the traction engine have two perfectly distinct fields of operation, and while the former is in time certain to supplant the horse, it is just as certain that it will not snuff out the traction engine. The working conditions and road effects of the two also are essentially different. For whereas one draws a trailing load distributed over (for the most part) four pairs of independent wheels, the other carries its load as it were upon its back. Is then Mr. Williamson prepared to demonstrate that per ton mile of traffic carried one class of self-propelled vehicle is distinctly superior to another so far as road wear and tear is concerned?

(e) I cannot now follow Mr. Williamson into County Council arithmetic. Yet, as he seems to regard the traction engine as essentially a road destroying Juggernaut, innocent of one single redeeming feature, I will give him a few simple figures to ponder over. He will probably admit that one shilling per ton mile is not a very exorbitant estimate of the cost of horsage. And he may possibly be aware that full work at sixpence per ton mile would make a motor waggon or traction engine owner permanently rejoice. He will also perhaps agree that £75 per mile is a fair average annual upkeep outlay for County Council main roads, and that traffic over them to the extent of, say, 300 miles tons per week, or 15,000 miles tons per annum, is not an especially heavy burden. If then Mr. Williamson is prepared to grant all that, then I imagine he will be compelled to concede that an annual saving in road transit to the tune of £375 per mile (sixpence per mile ton) is not only a thing to be encouraged, but that when contrasted with an upkeep realising only twenty per cent., a very respectable margin is left for application to road maintenance improvements. Such figures as these in fact afford the *raison d'être* of self-propelled traffic, and are my justification for repeated assertions that, given a sufficiency of traffic at horsage rates, steam tractor owners would only be too delighted to maintain the roads they operate at their own cost. This is but another way of saying that British highways should be kept up not only for but at the expense of the traffic, and until they are so maintained they will never in my opinion become thoroughly modernised and efficient.

(f) Mr. Williamson's information is certainly unreliable if he deliberately believes "Government mercenaries" to be necessarily ignorant upon the subjects of roads and road engines. Our military authorities have a very substantial knowledge of the effect upon macadam roads of horses' feet. Also as the largest owners in the world of mechanical tractors of all the most modern kinds, they have a very intimate knowledge of their operations on all classes of roads, and (as in the Transvaal) on no roads at all. When, therefore, its new mechanical transport corps is fully equipped, H.M.'s War Office will become thoroughly expert in all questions relating both to roads and road tractors. Is it then reasonable to suppose that in any Local Government Board highway inspecting appointments this knowledge will not be fully availed of? Apart, however, from this, it is in my opinion perfectly futile for County Councils to persist in their hostility to mechanical road transit. They may continue for a time to smash (as Mr. Williamson's article shows they are doing in Northumberland) individual traction engine owners. But public opinion and popular knowledge in road matters are rapidly advancing. And I shall be surprised if ere long a united phalanx of cyclists, motorists, and heavy road tractor owners, does not make its power felt in such an effective way that highway conditions which have been tamely suffered in the past will be pronounced absolutely intolerable for the future.

JOHN MORRISON.

THE GORDON-BENNETT CUP.

[2762].—Judging from the attitude the Automobile Club is adopting in forming the rules for the eliminating tests for the Gordon-Bennett cup, I fear it is permitting itself to be laid open to the suggestion that it is inclined to be biased in favour of one particular firm. Out of the three cars which are to represent England in the great race, the Automobile Committee have, I take it,

decided that the Napier is allowed to enter two out of three—without trial. This certainly presents the appearance of unduly favouring the winner of last year's cup, especially as the Automobile Club was careful to point out that it must not be taken as a precedent for future occasions. If it is not to be the rule for the future, what argument is there in commencing with so doubtful a precedent?

I do not stand alone in holding a firm conviction that it would be infinitely fairer and more satisfactory if the second and third races in the representation should be openly competed for.

I understand that the Star Engineering Co. are the only other firm that has paid its five hundred to compete in the eliminating tests against the Napier. Now, having regard to the fact that the issue is of national importance, surely all trade considerations should be secondary. The object of the Automobile Club should be, and I hope will be, to ensure that England shall be represented by the three best cars in the great race; but if the club persists in the arrangements as at present submitted, is there not a possibility that the Star Engineering Co. may be second to the Napier it has to meet in the tests (which one naturally concludes will be the best of the three Napiers), whereas it may possibly be superior to the other two, which it will not be permitted to be tried against?

I have not the slightest personal interest in the Star Engineering Co., but having formed the opinion that Mr. S. F. Edge must be a good sportsman, it occurred to me that the few minutes spent in writing this letter would not be wasted in making the suggestion that two Napiers should compete in the test against the Star or any other that may enter.

It is a praiseworthy effort on the part of the Star Engineering Co. in entering; and I have a confident hope that the Automobile Club and Messrs. S. F. Edge, Ltd., will recognise the advisability of making the eliminating trial a thorough test, and so ensure the popular desire that, on the day of the race, England shall be represented by the very best cars available.

U. STRATTON.

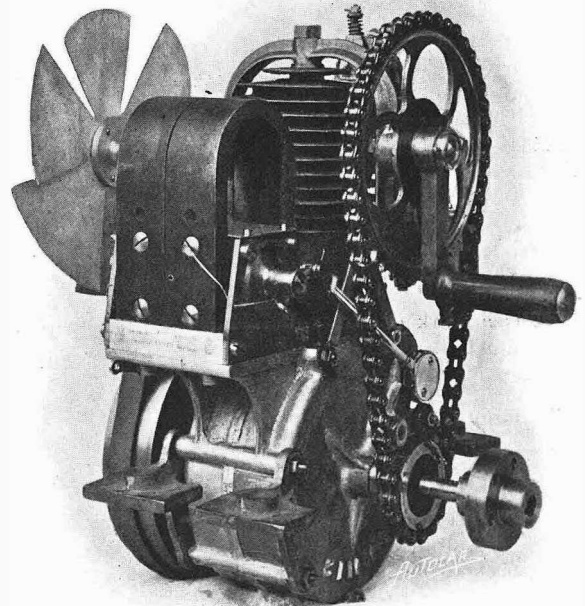
Flashes.

We recently mentioned an Act passed by the New Zealand Legislature as an example which the English Parliament might very well follow in regard to autocars. Another of our colonies—Ceylon—furnishes an example of the way in which the law should be administered. At Colombo the driver of a steam car was summoned for frightening a horse by the emission of steam, and the Commissioner of Requests in the course of his judgment said: "Horsed carriages have no greater right to the use of the public roads than motor cars have, and it is not inconceivable that at some distant date they will be as extinct as sedan chairs are now. The discharge of steam when a certain pressure is reached is automatic, and beyond the control of the defendant. The defendant in this case, so far from displaying negligence, seems to have exercised particular care, for he stopped the car when he saw that the plaintiff's horse was getting frightened, and when the accident occurred the motor car was stationary. I see no more reason why he should be mulcted in damages than why the first man who used an umbrella in London should have been assaulted by the mob as he was, or the stoker of the steam roller assaulted with a whip by the driver of a trap whose horse shied at the steam roller, an incident I witnessed on Galle Face. The defendant was driving a legitimate vehicle in a legitimate way, and I cannot, from my point of view, hold him legally responsible for this accident."

One night last week we returned from attending a meeting of the Society of Motor Manufacturers and Traders on board the newest 16 h.p. Napier car which Mr. Edge is now driving. The run was just short enough to make us desire that our trip, notwithstanding the darkness and the driving rain, might have been lengthened, and that our objective had been Basingstoke instead of Barnes. As we surged along the slithery Lady's Mile in the darkling park, we wished that all and sundry of the doubters as to British capability to turn out a superlative automobile had been with us in spirit, for certainly their doubts would thereby have been dispelled. One is not driven or propelled in this car—one is wafted, for of engine vibration there is none, and the springing and Dunlop tyres in combination disguise all road inequalities. When the car is stopped with the motor running, the bobble and bustle one has hitherto expected from within the bonnet are conspicuous by their absence. The cover might conceal an eight-day clock, for hardly more than the ticking of such is audible. No one who has experience of automobiles and who goes riding in the latest 16 h.p. Napier will quit it without profound respect for the quietude, extreme comfort, and withal the sense of power within the car conveys to the passenger. We congratulate Mr. M. S. Napier upon his latest production.

* * *

The Simms Manufacturing Co. are marketing a very compact little engine of 1 h.p., which they have specially designed for fitting to small boats up to about 14ft. in length. The engine gives off its full power at 1,000 revolutions per minute, and being air-cooled is provided with a fan—driven by a flat belt



off the flywheel—to assist in cooling. The magneto ignition is, of course, fitted, a crank and chain wheel being provided for starting purposes. The total weight of the motor complete is 56 lbs., and its overall dimensions are: 13in. from the front of the fan to the propeller coupling, 11in. wide, and 15in. high.



This view and the one at the bottom of the page show the new 20 h.p. Georges-Richard light car which Mr. Younger, M.P., has just purchased from Messrs. Mann and Overton, Ltd. The body is an English one made by Messrs. Thorn, of Great Portland Street, W., and it is very handsome, while the light storm hoods make the car comfortable for the worst of weather, provided, of course, the occupants of the front seat use the waterproof chin rug we have advocated frequently.

The Trackson motor omnibus is new to us, but from a report of a recent meeting in Belmont, Brisbane, called to establish a motor 'bus service for the surrounding district, we find it asserted that this petrol-driven carriage is "successfully competing with electric tramways in England and America"—an assertion which is altogether wide of the mark. The Trackson 'bus is constructed to secure a speed "up to ten miles an hour, and will carry from twelve to twenty-two passengers." A small company has been formed to develop the project.

* * *

The Decauville catalogue for 1903, issued by the Motor Car Co., of Shaftesbury Avenue, is a very interesting document indeed. The illustrations of the mechanical details of the Decauville car are particularly informing, and the one showing how the base of the crank chamber and the clutch guard and the base of the change speed gear case are all bolted up in one will be studied with considerable interest. It is one of the numerous original features of a car which abounds in constructional details of uncommon merit. The illuminated cover of the list is a work of art which must be seen to be appreciated.

* * *

Apropos of the three-cylinder discussion, a correspondent of our contemporary *La France Automobile* writes to that journal pointing out that five years ago the engineer of the Société Cannoise d'Automobiles built a three-cylinder explosion engine and fitted it to a car which could run at thirty-six miles per hour. M. Berret experimented with four and two-cylindered motors, but dropped both, being convinced that the three or six-cylindered engine alone could be properly and effectively balanced.

On the 25th inst. the *Auto Vélo* will carry out its third annual race for motor tricycle parcel delivery machines.

* * *

Messrs. Napier and Son have been awarded a bronze medal for the appearance of their stand at the late Paris Exhibition.

* * *

Some unknown busybody with more money than brains has forwarded £4 to the Prefect of the Paris Police to be handed by this official to the cycling policeman who will score the highest number of summonses against automobilists during the year. We should imagine that the Prefect of Police will return this money to the prejudiced person, sending at the same time an intimation that his officers do not need bribes to do their duty, and that such offers as his are not calculated to improve the *morale* of his force.

* * *

The Long Acre Motor Co., of 37, Long Acre, are now showing, as fitted to a 7½ h.p. tonneau body Wolseley car, an ingenious, simple, and well-constructed adjustable brougham top, which, by the way, can be fitted to the tonneau of any car in a few minutes, and removed as quickly when required. The example shown us when we called lately was finished in leather, on an ash frame, and was glazed at front, sides, and over door at back. The top is so made that the front glass swings up and is suspended from the roof, and the sides and door windows let down as in an ordinary carriage. The cost of one of these tops is from £50, but they will be made in all styles to suit varied tastes, and in the more expensive types will have aluminium panels. The Long Acre Motor Co. now have extensive body works at Hammer-smith, so that there will be little or no delay in the delivery of these most desirable brougham tops. We hope next week to illustrate the brougham top both finished and in frame.

* * *

In *The Autocar* of last week, in our description of the 70 h.p. Panhard an error crept in. It was stated that Mr. Henry Farman ran this vehicle second in the heavy car class. This was not the case, as the car was placed first and awarded the cup. It was, as a matter of fact, second in the race irrespective of class.



Automobilists in York will be interested to know that they can obtain hotel and storage accommodation at Lowen's White Swan Hotel, Market Place. We are also informed that petrol can be obtained any day, Sundays included.

The Earl's Court Exhibition organised by the Stanley Club opens next Thursday, the 15th inst. From the particulars we have received, it appears that it will be a good show and a remarkably successful one for a first venture. The opening ceremony will be performed by Sir A. K. Rollit, M.P.

* * *

The Dunlop Tyre Co. advise us that they are experimenting with a good many devices to reduce the tendency of motor tyres to sideslip. Similar series of experiments are being conducted abroad, and the Dunlop Co. inform us that in many cases these constitute an infringement of their own British patent rights. At the same time, they tell us, to facilitate matters, they are willing to procure these devices and to fit them for their clients to Dunlop tyres when they can be applied, though, of course, they will assume no responsibility for their efficiency.

Shortly, Mr. J. W. Stocks intends to drive a 6 h.p. De Dion from Glasgow to London and back in four days, averaging 200 miles per day.

We hear that the next dividend of the Continental Tyre Co., of Hanover, will probably be fixed at fifty per cent., as against forty-five per cent. on the previous twelve months' business.



Impressed by the success of other municipal bodies with the Leyland steam tip wagon, the Corporation of Blackburn decided to invest in a similar vehicle. The illustration depicts the wagon ready for delivery.

A little machine called the Morette is being made by Mr. Dickinson, of Aston Brook Street, Birmingham. It is of the three-wheel type, and the front wheel drives and steers. The engine is of the two cycle valveless type, and drives direct on to the front wheel tyre by means of a rubber-covered friction wheel. A F.N. carburetter is used, and the engine is lubricated by drop feed, the oil being atomised as it is carried into the engine with the explosive mixture. The steering is of the bath chair type, and the engine can be started by means of a small handle in front of the rider, which works a ratchet on the back wheels, and then the front wheel through the friction starts the engine. For a single machine a $1\frac{1}{2}$ h.p. engine is fitted, but when a sociable for two is made an engine of 2½ h.p. is provided.

* * *

A Cycle and Motor Show was opened at Leeds in the Coliseum on the 7th inst., and remains open till the 14th inst. There are some interesting exhibits of motor cycles, cars, and accessories.

* * *

A pump guard is now fitted to the Gladiator cars, so that it will be impossible for the pump to be damaged by the throwing up of stones from the road, as was mentioned in a recent issue.

* * *

On Tuesday next, the 13th inst., the makers and sellers of motor bicycles are called to a meeting at the Automobile Club to discuss the advisability of holding trials of reliability of motor cycles during 1903.



Mrs. G. S. T. Paine at the helm of her 11½ h.p. Clement car. During the three months it has been in this lady's possession it has travelled upwards of 3,000 miles, and has given no trouble with the exception of the carburetter freezing. This has now been cured by jacketing it with hot gas from the exhaust, and everything now runs with perfect regularity.

An ambitious trio have been arrested in Paris charged with annexing an autocar valued at £320 belonging to a well-known banker.

* * *

In a review of 1902, a philological contemporary alludes to the motor industry as having "advanced with snorts and hoots."

* * *

Two motorists appeared at Marlborough Street recently, one of them charged with going too fast, and the other with not going at all. Forty shillings in each case rather inclines one to the idea that, judicially, the automobilist is betwixt a certain gentleman and fathomless waters.

* * *

A very remarkable instance of the manner in which accusations as to high speed are recklessly brought against motorists by the police was shown in a case in which Mr. W. H. Astell figured. When returning from Brighton recently, he knew that the police were timing at Crawley, but was astonished at being stopped by two uniformed constables, who informed him that he had covered a quarter of a mile in 39s.; that is to say, rather over twenty-three miles an hour. Mr. Astell then ascertained that he had been timed from the point where the men were stationed, they deluding themselves that they could tell the exact moment at which his car passed a point a quarter of a mile away on a perfectly straight road. It is possible to estimate the position on a bend, but on a straight road it is, of course, out of the question for even approximately accurate timing. But this is not all. Mr. Astell knew that he was in a timed area, and had consequently put in his gear, which gives him exactly eleven and a half miles an hour; and yet, on the strength of this, he was accused of compassing just double the speed. Unfortunately, Mr. Astell was not able to answer the summons at Horsham, having a still more important engagement elsewhere; but he laid the facts before the magistrates, and we shall be interested to hear their decision, though, after all, this is not the only point. It is monstrous that the police should be permitted to bring charges of this kind against law-abiding people.

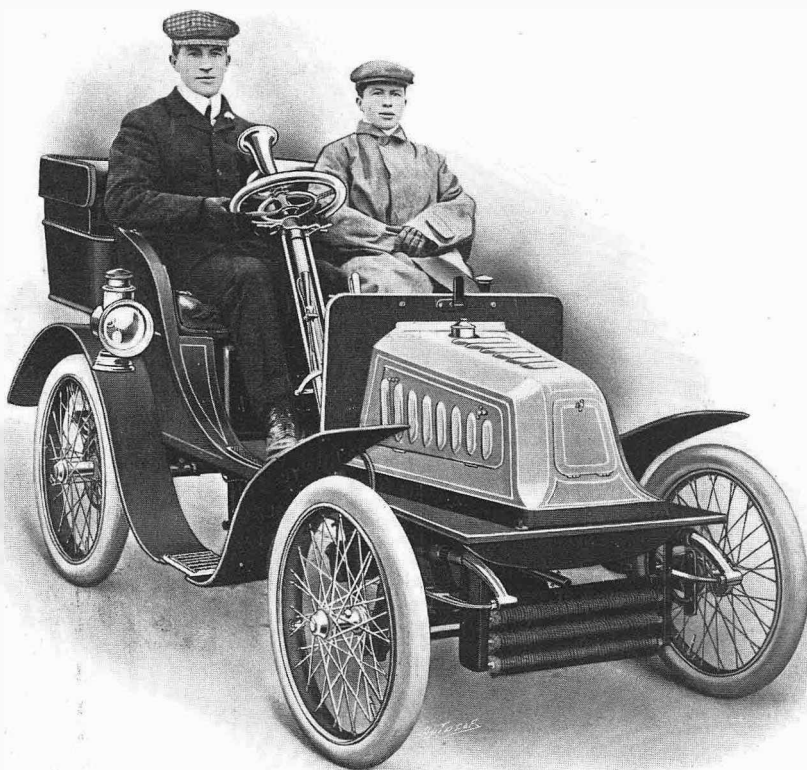
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The Managing Committee of the Crystal Palace Automobile Show have decided to withdraw the clause restricting height of signs. These can therefore be any reasonable height, but they must be placed parallel with stand, and must not obstruct the light of other exhibitors.

We learn that Mr. F. T. Bidlake has joined the firm of Messrs. S. F. Edge and Co., Ltd.

* * *

According to a report recently issued by His Majesty's Consul at Buenos Ayres, there is a considerable enquiry for automobiles in that part of the world. He believes that ere long automobiles will be used for ambulances, post office vans, police carts, parcel vans, fire engines, as well as for private carriages. Continental and American firms are making bids for this trade, but so far no British firms have entered lists. The Indianrubber, Gutta-percha and Telegraph Works Co., Ltd., of 140, Calle Reconquista, Buenos Ayres, is taking the matter up, and will supply enquirers with information on the subject.



The Peerless 8 h.p. light car, the production of Messrs. Coxeter and Sons, Ltd., of Abingdon-on-Thames. The engine is a single cylinder one, with a 4½ in. bore and 4½ in. stroke, developing its full power at 1,500 revolutions per minute, and driving direct on to the rear live axle. The wheelbase is 6 ft. 6 in., and the total weight about eleven hundredweight. As will be seen it is a very smart little car, and it is said to run very quietly and without vibration, the latter being almost imperceptible, even while the car is standing.

Owing to increase of business, the United Motor Industries, Ltd., have been compelled once more to remove to larger premises. Their new show-rooms and stores are very central, and their English address in future will be 45, Great Marlborough Street, London, W.

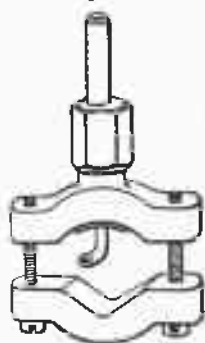
* * *

The *New York Herald* complains that the American automobile is not up to date. Among other things, the old style castings are still used, with poor imitations in carburettors and transmission gears. American manufacturers, our contemporary thinks, are now where they should have been three years ago. In other quarters it is anticipated that very shortly America will lead in automobilism.

At this season of the year the members of the medical profession are usually very busy. Nevertheless, one member has found leisure to make a pronouncement that "the tendency to crime is increasing because of the introduction of electric cars, automobiles, telephones, and other devices of the scientific enemy." He argues that people now take less exercise and think more. Consequently there is an excessive strain on the nervous system, and, *ergo*, an enfeebled nervous system leads to crime. Whatever virtue the medico's logic may at first sight appear to possess is lost when we remember that the tendency is for crime to decrease rather than increase, and the motorist may with equal force and reason argue that the decrease is attributable to the introduction of a more speedy system of locomotion.

* * *

In our issue of November 29th we described a simple attachment for connecting up a manometer to the water-circulating system. Although the fitting was clearly described at the time, there is no doubt that the sketch we give will graphically describe the fitting of this handy little accessory. The small curved tube is inserted in the hole in the water pipe, with its mouth towards the flow of the water. An indiarubber washer slips over this tube, and serves to make a water-tight joint when the clip is tightened up by the two screws. For the tightening of these, in addition to the usual slot there is a hole through the head so that it may be got at readily. Messrs. G. T. Riches and Co., of Gray's Inn Road, make the clip.



* * *

With the view of giving one of the new 1903 pattern 6 h.p. De Dion voituresses a thorough trial, Mr. J. W. Stocks spent a strenuous Christmastide on one. He decided to pass his holiday in Yorkshire, and left town soon after one o'clock in the morning. He had breakfast at Stamford (eighty-nine miles) at 7.30 a.m., and then resumed his route. However, he was soon overcome by sleep, and feeling it was dangerous to go on, drove the car on to the grass, and indulged in a short nap. Thus refreshed, he ran on to Lincoln, where he stopped for half an hour, and eventually pulled up at New Holland Pier—177 miles from London—without a single involuntary stop, except that caused by a jury-rigged lamp-bracket, which cast one of its paraffin lamps. He returned to town a few days later, again covering the 177 miles without any untoward incident. The car was fitted with the standard gear, and it is worthy of note that the low gear was only used three times in the 177 miles on the outward journey, the first time being on the hill just north of Grantham, the second on the hill out of Lincoln past the cathedral, and the third time on Eltham Hill north of Brigg. Of course, no passenger was carried, but a good supply of spares was taken, and the run gives an excellent idea of the capacity of the little vehicle, which was described in some detail in *The Autocar* of December 27th, 1902. This reminds us that in the

description given there was a slight inaccuracy, as it was stated that the ignition was by accumulators, commutator, and trembler coil; but, as a matter of fact, the ignition has not been changed in any way, and the 6 h.p. has the usual trembling contact breaker. The only difference is that a metal instead of a vulcanite plate is used. The coil and dry battery are on the standard De Dion type.

* * *

Some time ago we published, with reserve, a statement from a Welsh paper to the effect that Lord Anglesea had a scent spray affixed to his car, so that any faint odour from the exhaust should be entirely overpowered by the sweet odours of his scent pump. This statement appears to have stimulated another publication, and it is now stated that Lord Anglesea not only drives the scent-distributing car, but has his hair tied up with ribbon to match the particular scent distributed on the day—violet, rose, or primrose, as the case may be. How he ties his hair or why he ties it up we are not told, but so many ridiculous tales have been circulated about the bejewelled peer that, even if he does bedeck himself with ribbons and also endeavour to deodorise the countryside with his scent car, the mere fact of his being an automobilist proves that he is not wholly devoted to unmanly amusements, and should be set down to his credit.

* * *

We are pleased to note that the General Electric Co., one of the largest and best-known electrical engineering firms in the world, are taking up the manufacture of electrical accessories in connection with motor cars. They have issued a special list of these parts, which contains a very wide range of accumulators, from the small pocket type to larger ones of from eight to sixty ampère hours capacity. The list also includes a special set of wet cells which have been designed as a stand-by in case of failure of accumulators or dry batteries. To use these cells it is only necessary to make up a solution electrolyte with salts provided, and pour this into the cells by means of the special funnel supplied with the batteries. It is stated that these stand-bys are capable of running a single-cylinder engine upwards of a thousand miles, and may be recharged at the end of that time. For re-charging, they have a small charging board, which they sell at a very reasonable price. As is generally known, it is impossible to re-charge an accumulator from an alternating current, which, to say the least of it, is very awkward, as so many of the public companies supplies are on this system. To overcome this they have a small motor generator, which converts the alternating current into a continuous current of the correct amperage and voltage for the charging of these accumulators. They also have another apparatus, known as the Batten's Rectifier, which serves the same purpose, and is somewhat cheaper. In lamps suitable for connecting up with an accumulator, they have some very neat designs, and for those who invest in an inspection lamp of this kind they have a pattern which is well worth attention. Coils, switches, and instruments are included in the list, and are, as usual, of that high standard of manufacture which is associated with the General Electric Co.

CAMBRIDGE UNIVERSITY AUTOMOBILE CLUB.

A club has recently been formed in Cambridge under the above title. Commodious premises have been leased in Jesus Lane, which are being fitted out as a thoroughly well-equipped garage, including inspection pit, electric light, and repair shop; while a competent mechanical staff will be in regular attendance, and repairs undertaken. There are also good clubrooms, which will be stocked with current automobile literature. Membership is open to past and present members of the University. The club is altogether a most promising one. All information may be obtained from the hon. secretary, Mr. Hugh Gregory, St. John's College, Cambridge.

New Patents.

This department is conducted by Mr. G. Douglas Leechman, consulting engineer and registered patent agent, 18, Hertford Street, Coventry; 32, York Street, Dublin; and 9, Exchange Chambers, New Street, Birmingham; from whom any further information respecting patents, designs, and trade marks may be obtained.

The following specifications were printed and published on 24th December, 1902. All notices of oppositions to the grant of patents on the several applications should be filed not later than 10th February, 1903.

1901.

24,743.—G. Preston. Variable speed gear in which a driving wheel may be brought into gear with any driven wheel of a graduated series.

24,942.—H. J. Fisher. Worm gearing with springs at each end of the worm or between the worm wheel and its shaft.

25,312.—W. Langdon-Davies and A. Soames. Internal combustion engines are provided with additional suction valves admitting gas to a passage leading to the inlet valves, such additional valves having adjustable springs.

1902.

113.—H. Spurrier, jun. Radial screws threaded into the felloes and rims of wheels may be caused to project to form a non-slipping device.

14,385.—J. D. Griffen. Swivelled or flexible running gear or frame for motor vehicles.

18,465.—V. Klement. Magneto electric igniting apparatus with spring contact device and cover for same.

19,744.—J. Nutry, C. P. and R. Lenk. Variable speed and reversing gear with reciprocating members and intermittent clutch action.

20,776.—W. J. Iden. Steering gear comprising an extending and contracting screw and nut union.

Answers to Correspondents.

QUERIES OF GENERAL INTEREST.

KEEPING STEAM.

Q.—I recently bought a steam car and find great difficulty in keeping steam against the wind if the latter be at all strong. Will some of your readers give me their experiences? The car, which with 50 lbs. pressure will run with the wind or on a quiet day, baulks with 150 lbs. against the wind. Is this generally so, or am I in fault in my driving?—JONAS.

A.—Your car should not be so seriously affected by a head wind, and we are rather inclined to think there is something wrong with the driving; but you do not name your car, which leaves us rather in the dark. If your engine has the link motion reversing gear, you should have the reversing lever in its extreme notch, so that the slide valve gets its greatest travel. If you can keep up 150 lbs. of steam against a head wind, it is not the boiler

which is at fault so much as the engine. If you have a big hood on a small-powered car, this might partly account for your trouble.

This week the following correspondents have been, or will be, replied to by post:

E. Watson.	J. B. Ball.
H. A. Dixon.	H. E. Helmsley (Portmadoc).
"Aluminium."	J. J. Brown.
A. H. Walker.	F. T. Harrison (Sunbury)
H. C.	L. M. Pardoe.
W. L. Jones	S. P. Hurrell.
J. Grove.	L. H. Lawrence.
T. J. Hennessy.	Peter Mayo (Newtown).
P. L.	Ernest Cook (Haverfordwest).
F. Carter.	L. Leguin (Davos Platz).
W. Rose.	Geo. Sutton.
W. and M. (Birmingham)	Phillip Condor.
Auto. Agency.	E. A. Sturt (Sydenham).
S. Lomas.	S. B. Reynolds.
H. Fenton.	A. A. Salaman.
T. S. Gillett	M. Rokeby (Wickham Market).
A. G. Marsh (Southend).	G. G. Hannan
Herbert Rowe (Leeds).	(Bradford-on-Avon).
B. L. Gamet.	
L. Bell.	
J. Bennett Stanford	
(Tisbury).	

Our thanks are due to the following for items of news and various topics of interest which have been or will be dealt with: Hugh Campbell, W. Pullan, R. Scaife, C. Winter-Wood, and W. Williams.

NOTICES.

SUBSCRIPTIONS.

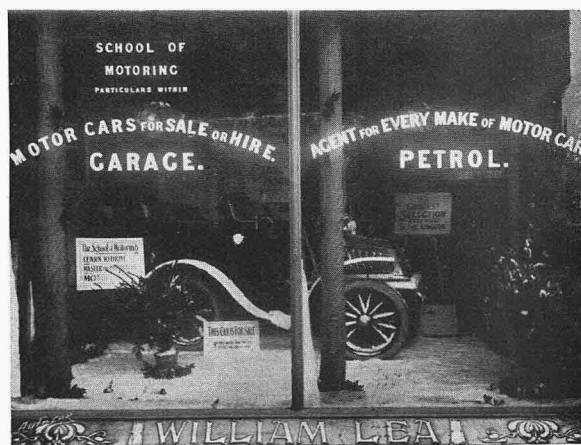
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For Christmas, Mr. William Lea's depot in Berry Street, Liverpool, was seasonably decorated. The illustration we give, reproduced from a photograph, does not do justice to the appearance of the window—in fact, it is impossible to convey this pictorially. It will be seen that the scheme represents a car which has evidently been in a snow storm, the fair driver of which has only just dismounted, leaving behind her her rugs and wraps. In the snow can be traced her dainty footprints. Of course, the idea was to give people the impression which so many non-motorists lack, that a motor car is good for use in any weather.