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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CONTENTS.

"THE AUTOCAR" SUBSCRIPTION RATES.

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Notes.

Car Nomenclature.

It is time that some understanding was come to with regard to the terms used to distinguish the various types of autocars. This is particularly the case with regard to voiturettes and cars of medium size and weight. Formerly, the term "voiturette" was used to signify a light little car for two people, or, at the extreme, one giving seating accommodation for two in front with a light dickey for a third person at the back. So far so good. Later, the matter was complicated by reason of the fact that here and there would be found a large powerful vehicle with seating accommodation for two only, the tonneau, or back seat, being replaced by a large wedge-shaped tyre and tool box. At that time voiturettes were very few in number, and were gradually developing into light four-seated cars—quite different machines from the heavy expensive vehicles weighing over a ton, but which were at the same time much more ambitious carriages than the voiturette. In fact, the earlier light cars in almost all cases weighed over threequarters of a ton. The type of vehicle which is now becoming so prevalent, and which weighs from half a ton to fourteen hundredweights, and has more than 1 h.p. available for every hundredweight, had not then been evolved. Now, however, the matter has become hopelessly complicated by some writers designating voiturettes as "light cars," or "small cars," so that no one knows precisely what is meant by the term "light car," and "small car" is even more ambiguous. It would save a great deal of misunderstanding if the makers would arrive at some definite decision on the matter. For instance, cars weighing less than eight hundredweights and providing seats for two or three people might be known as voiturettes. Those between eight and twelve hundredweights with seats for three or four people could be called "small cars." Vehicles over twelve hundredweights up to, say, sixteen hundredweights, might be designated "light cars"; while all above that weight would come in the category of "large cars." While the first three terms are used so loosely, enquirers are often put to a great deal of needless trouble. They do not know to what sort of machine reference is made. We commend the matter to the attention of the Society of Motor Manufacturers and Traders. If they were to come to a definite decision upon it, and were to designate their cars accordingly, such a decision would undoubtedly result before long in a general agreement on the subject, particularly if in this matter they sought the co-operation of the Automobile Club, and the decisions arrived at were the outcome of their joint deliberations.

Hill Handicaps.

If any of our readers have worked out a really simple formula for handicapping hill-climbing trials we should be glad to see it. We do not mean a formula like that of the Automobile Club's, which, after the contest is concluded, apportions a value to the performance of each car, but one which will enable the promoters of a friendly contest, such as is one of the most interesting features of county and district clubs' programmes, to get out a handicap. We have had several enquiries from club secretaries for such a system, the latest request being from Mr. Albert Newton, hon. secretary of the Reading Automobile Club, whose wants may be taken as typical of those of others. A simple formula is required which will take into account weight and b.h.p. It should be remembered that the majority of honorary officials of automobile clubs are not engineers, and that even if they personally did not object to algebraical calculations

the majority of their members would be averse to them. The requirements are for the simplest possible system, which would only take absolute essentials into consideration and deal with them in the clearest possible manner, while not robbing the contest of its sporting element. It should pay no attention to such factors as efficiency of transmission or make of tyres, still less to the ratio of gears available. Even supposing these could be dealt with in a simple way—which we doubt—there would still be the element of personal skill in driving, and the condition of the motor and mechanism as a whole. As a matter of fact, this last item has had more to do with the contradictory results of some of the impromptu hill trials than anything else, as it often happens that comparatively few of the machines are in their best condition on the day of the trial.

Superannuation.

In many departments of life there is an age limit beyond which men are not permitted to take active participation in certain work, but are superseded by younger people. This is a rule which must always bear hardly upon many, but it appears to us that it would be in the interests of justice if it were applied to its administration by unpaid amateurs. In other words, it is painfully obvious that a large proportion of the magistracy of the country are too old to administer their important duties properly. For some reason which is difficult to explain, there appears to be a belief that so long as a man is not bedridden or confined in a madhouse he is fit to administer the laws of the land, and the result is a number of prejudiced persons of extreme age and feebleness are permitted to act as honorary administrators of the law. Many of them are entirely out of touch with all that is modern and absolutely opposed to progress in any form. We do not wish to speak hardly of them, as no doubt senility accounts for much which would otherwise be inexcusable. Far be it from us to suggest that everyone well advanced in years is unfitted to hold the position of a magistrate. At the same time, the risks of injustice with the present system of allowing magistrates to continue their duties till they are absolutely incapable of being driven in a closed carriage or of being wheeled in a bath chair to the bench is a mistaken one; and although the more virile and open-minded would suffer if an age limit of, say, sixty-five were imposed, we feel sure that they would agree with us that it was necessary. After all, no real hardship would be imposed, as the duties carry with them no pecuniary rewards; and, therefore, beyond robbing some men of a hobby, no harm would be done. The point is one which is well worth consideration, as we find from the reports which reach us from all parts of the country of unjust decisions affecting motorists the sufferer almost invariably mentions the hoary age of the majority of the bench. Many of them are long past following a good argument. Little is left of their mental endowment which is of service to the administration of justice—prejudiced ignorance and a not unnatural opposition, considering their great age, to all that is new being the predominant characteristics. Fortunately, younger and less prejudiced blood is being introduced into the magistracy, but something must be wrong with the system when we find, as we do, that men of good position and with the greatest respect for the law confess to us sorrowfully that until time has removed certain incapable persons from the bench it is impossible for a man who follows a new pastime to obtain justice. It is a serious statement to make, and yet if looked at impartially it is impossible to deny its truth.

FOR TOWN USE. Some months since we announced that a silent petrol car was being built by the Napier Co. for town use. The machine we illustrate is the first of a series of 12 h.p. Napier landaulettes which will shortly be seen in the London streets in use by various private owners.

USEFUL HINTS AND TIPS.

ON RECHARGING ACCUMULATORS.

Continued from page 6.

A Steadying Resistance.

With all forms of primary battery it is advisable to use a steadying resistance of some sort. Even a battery of the type described in the last article, which has by no means a low internal resistance, will be found to send a current of four or five ampères through an accumulator when first connected up. With many other batteries a resistance is still more necessary, and there are many forms to be had, most of which will answer the purpose. A slight disadvantage of some of these is that they do not allow of a steady, gradual change of resistance being effected. A good form is the carbon resistance, but it is our intention here to describe a type which can be more readily constructed without skilled workmanship.

A planed deal board about 15in. long and 4in. wide will serve as a base. About an inch from each end strips of some insulating material are placed across the board. As it will be necessary that these strips should take several screws without cracking, ordinary deal would not be suitable here.

A good material for the purpose is the three-ply wood, which can be obtained from any dealer in fretwood. The strip A measures about 3½in. by

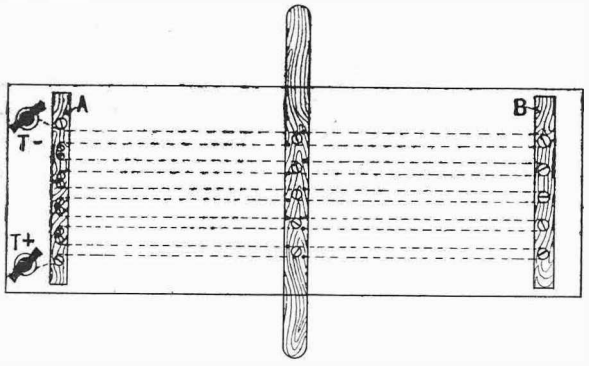


Fig. 1.—Plan of adjustable resistance board.
A B, insulating strips three-ply wood. T—T+, terminals.

¾in. by ¼in. thick. At B two strips are used, so that the total thickness is ½in.

For the resistance itself, about 10ft. of platinoid wire will do well. In ordering this, it should be specified to take from six to eight ampères. In this case, it will not heat unduly at the ordinary charging rates. One end of this wire is fastened to the wing terminal T—. The first screw at A is then partly screwed in, and the wire is twisted tightly round the shank, and then passed along the length of the board, round the screw B, and back to the next screw at A. At this end it passes round two screws nearly touching one another before returning to B. The wire is given a complete turn round the shank of each screw before going on to the next. When about ten lengths of wire are completed, the screws may be screwed home, which forces the wire out round the heads, and so tightens it up.

It may be further tightened by a strip of wood placed edgewise like the bridge of a banjo, and forced up near to A, raising the wire to an equal height at each end. The loose end of the wire is attached to the terminal T+.

Between T— and T+ is a strip of brass or copper, or a piece of heavy copper wire. In the first case, its shape would be that shown in fig. 2. The end E is attached to terminal T+, and the slot at the other end is secured to T— when it is desired to "shunt" the resistance out of circuit.

Fig. 2.—Swinging bridge piece to open or close the resistance.

The adjustment of the resistance is effected by the strip S S of three-ply wood (fig. 3) sliding beneath the wires.

The method of obtaining contact is shown in fig. 1, and is enlarged in fig. 3. In the latter figure the bend of the wire caused by the screws is somewhat exaggerated. The two small screws G S G S press the wires firmly against the shank of the larger screw, giving a good contact, and the more the resistance is used the better the contact becomes, since the surfaces are worn flat by rubbing.

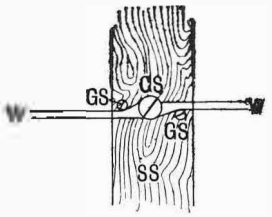


Fig. 3.—Details of stop in the sliding bridge.
W W, wires.
C S, contact screw.
G S, guide screws.
S S, sliding strip.

The advantages of this method are: (1.) The wires are kept straight, since the motion of the sliding piece is such that all bends or kinks are gradually straightened. (2.) The surfaces giving contact are kept bright and clean by the rubbing of the screws.

It will easily be seen that when the sliding strip is in the position shown, all the wire at the side B of the strip is shunted by the screws in the strip. Consequently the nearer the sliding strip is to B, the greater is the resistance offered to the current.

This resistance may be screwed on to the front of the box containing the primary battery, the only alterations necessary in the wiring being that the wire from the first carbon passes to T—, the current flows through the resistance, or through the copper shunting strip, and the + terminal of the accumulator is connected to T+.

The use of the resistance is very simple. When first connecting up, put the whole resistance in circuit, and gradually diminish it, and finally cut it out altogether, as the current decreases.

If using the battery described in the last article without an ammeter, the resistance may be shunted when the current has been flowing for ten minutes.

Before leaving the subject of primary batteries, we may say that if a reliable agent is fairly near, we should make use of him rather than charge at home, unless a lighting circuit is convenient. We always have a primary battery at hand, however, and this we keep filled with water, to preserve the porous pots in good condition. Large bottles of the necessary solutions in this case are kept ready mixed, so that the battery may be ready for use at a few moments' notice.

THE 14 H.P. THREE-CYLINDER ARGYLL CAR.

THREE CYLINDERS 90 MM. BORE, 120 MM. STROKE, MECHANICALLY-OPERATED VALVES, GEAR DRIVEN, THREE SPEEDS FORWARD AND A REVERSE, DIRECT DRIVE ON THE TOP SPEED, PRESSED STEEL FRAME. WEIGHT 14½ CWT.

The three-cylinder Argyll car, which made its first public appearance at the 1903 one thousand miles reliability trials, is the subject of the following detail article. These details may be applied broadly to the other powered cars produced by the Hozier Engineering Co., of Glasgow, though there are some modifications in the lower powered cars. For instance, in the single and double-cylindered cars the well-known and well-tried thermo-syphon water-circulating system is employed, while for the three and four-cylinder cars pump circulation and honeycomb radiators are used. This is the only radical departure in the general designing of the Argyll cars.

The Chassis.

The long side members A A of the frame and the transverse members A^1 A^1 are hydraulically pressed from the highest quality of sheet steel into a ∩ channel section; the side members are deep in the centre, and taper off towards the ends. The sheet steel is cut to shape, so as to form pockets for spring ends, as is shown by the elevation. This method (which is patented) allows of the spring pockets being made from sheet steel, and secures extreme lightness with strength. No underframe is used, the engine B being carried by arms bolted on to the main frame. The flywheel C contains the friction clutch, and is actuated by the pedals P P^1. When the pedal P^1 is depressed, the band brake E is also applied. A sliding universal joint C^1 transmits the power to the change-speed gear. This joint prevents any strain arising in the gears or engine bearings when going over rough roads. The gear box D is carried by arms bolted to the main frame. The gear box lid is held down by clamps D^1. These can be removed by unscrewing two nuts, when the whole gear can be taken out. The power is transmitted to the live axle H through the universally-jointed shaft G, the universal joints being marked F F. The shaft which carries the bevel driving pinion is squared, so that the rear joint F can slide on the projecting square shaft when the back axle moves about the radius rods S^1 (elevation). The plan and elevation given herewith are for the 10 h.p. two-cylinder car; the chassis of the 14 h.p. three-cylinder car is precisely similar.

The Engine.

The left-hand side of the engine is shown in section through the centre of the cylinder. Each of the three cylinders has a bore of 90 mm. and 120 mm. stroke. The piston D is of ample depth, and four piston rings are provided, the bottom ring holding the wrist pin in position, dispensing with the use of any small screws which may possibly work loose. The water jacket is of good capacity, as can be seen by the drawing. The connecting rod E is

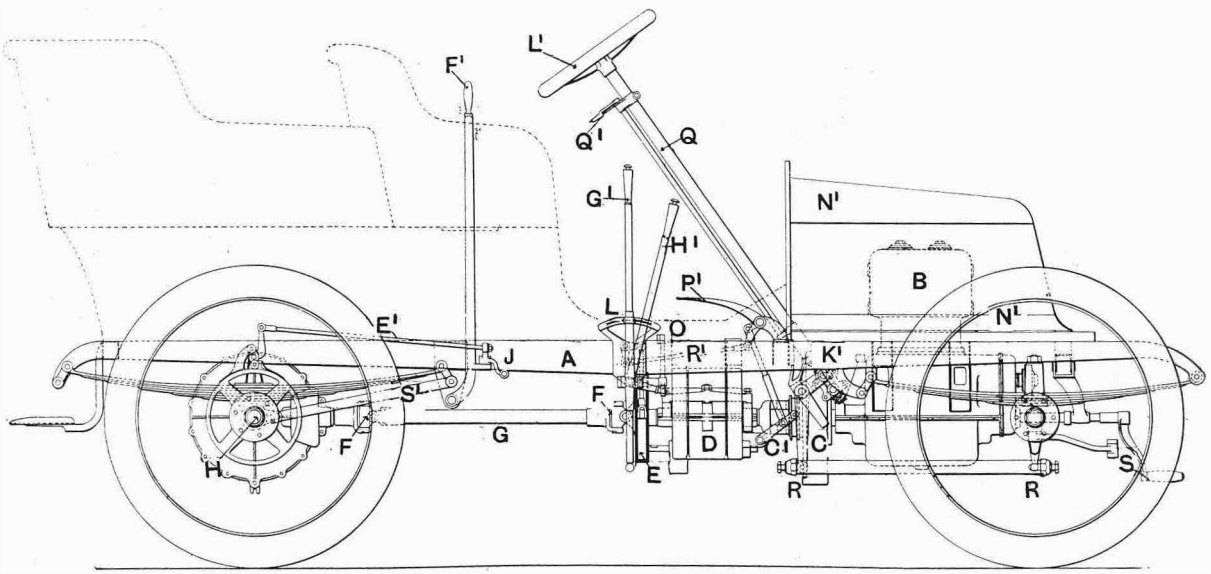


Fig. 1.—Elevation of a 10 h.p. Argyll car.

A, frame
A^1 A A^1, transverse members of frame
B, engine
B^1, engine carriers
C, flywheel and clutch
C^1, clutch disengaging levers
D, gear-box
D^1, gear box clamps
E, main shaft brake drum
E^1 E^1, driving wheel brake rods
F F universal joints
F^1, brake lever
G, propeller-shaft
G^1, first, second, and third speed lever
H, live axle
H^1, reverse speed lever
I I, driving wheel brake drums
J J, hub brake compensating levers
K silencer
K^1, irreversible steering nut
L, change speed quadrant
L^1, steering wheel
M, first speed bell crank
N, second and third speed bell crank
N^1, natural cooling bonnet
O, reverse third speed bell crank
P, clutch pedal
P^1, brake and clutch pedal
Q, steering pillar
Q^1, mixture and ignition quadrant
R, steering ball joints
R^1, gear shaft brake rods
S, starting handle
S^1, radius rods
T, front axle
U U, front axle swivels
V, carburetter
W, carburetter feed pipes
X, exhaust pipe

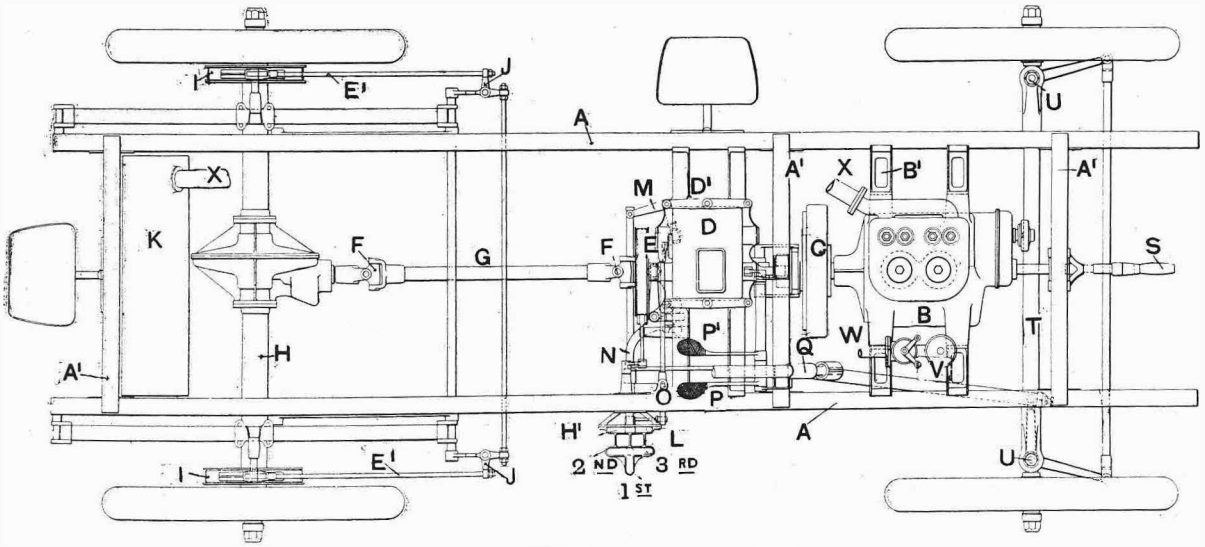


Fig. 2.—Plan of a 10 h.p. Argyll car. For letter references see fig. 1.

machined from a steel stamping, and the crankshaft B is made from a high quality of nickel steel, the balance weights being solid with the crankshaft. There is a bearing between each crank, and these are interchangeable with the connection rod end bearing. The centre portion of the engine is shown in section through the centre of the valves, which are interchangeable. M is the inlet valve, and N is the exhaust valve, both of which are mechanically operated by the camshaft H, which is driven by the two-to-one gear I and K. The valve-lifters are marked W, and these are provided with forks which fit over the rollers L. The lift of the valves can be adjusted by the pin and lock-nut U.

The outside view of the engine is shown on the right-hand side. O is the inlet and P the exhaust pipe. These are held to the cylinder heads by means of dogs. Inspection doors are fitted at both sides and bottom of the crank chamber, and are lettered R. Lubrication is on the splash system, and the

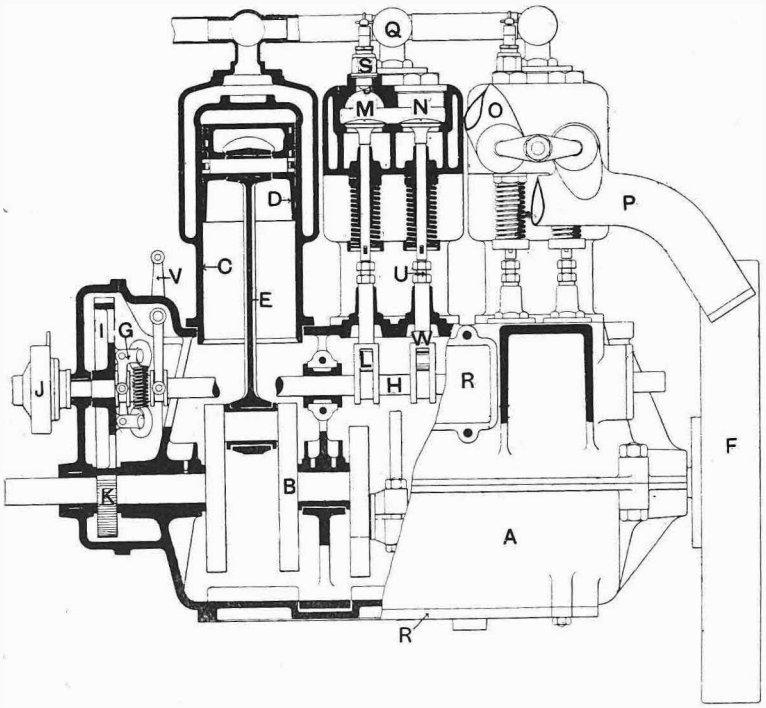


Fig. 3.—Part sectional elevation of the 14 h.p. Argyll engine.

A, crank chamber
B, crankshaft
C, cylinder
D, pistons
E, connecting rod
F, flywheel
G, governor
H, camshaft
I, half-speed gear wheel
J, commutator
K, half-speed pinion on main shaft
L, rollers for cam
M, inlet valve
N, exhaust valve
O, inlet pipe
P, exhaust pipe
Q, water union
R R, inspection doors
S, sparking plug
U, adjusting pins for valves
V, governor controlling lever
W, valve lifter

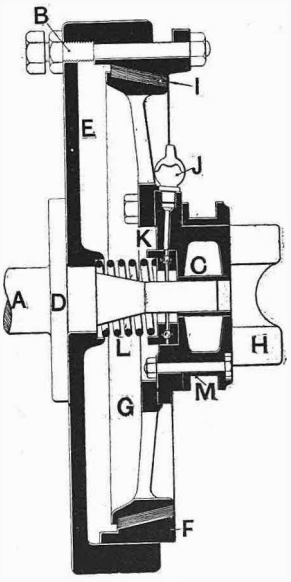


Fig. 4. Section of clutch.

A, engineshaft
B, friction clutch adjusting bolt
C, engineshaft bush
D, engineshaft flange
E, engine flywheel
F, conical ring
G, friction clutch
H, friction clutch coupling
I, friction clutch leather
J, lubricator
K, ball race
L, spring
M, hardened steel grooved sleeve or coupling

bearings are provided with oil pockets, ensuring the proper distribution of the oil. The engine is suspended direct to the main frame.

The Friction Clutch.

A (fig. 4) is the engineshaft, which is provided with a flange D, to which is bolted the flywheel E. The internal portion of the friction clutch G is mounted on a hardened steel bush C, in which the engineshaft runs when the pedal is depressed. F is a conical ring, forming the external portion of the clutch. This is held in the flywheel by means of the bolts B, of which there are three. Any wear of the leather can thus be immediately taken up by drawing the conical ring F further into the flywheel by means of these bolts. I is the leather covering of the internal portion of the clutch G, and the spring is shown at L. The clutch is self-contained, and as it all turns together no end thrust can be transmitted to any bearing, excepting when the pedal is depressed. This brings the thrust ball bearing K into action, so that a loss of power only takes place when the car is being stopped. A hardened steel grooved collar M is bolted to the internal portion of the clutch G, and engages the clutch actuating lever. A lubricator J is provided for supplying oil to the bearings. By this construction, the clutch can never get out of alignment, as all parts are mounted concentrically on the engineshaft. By unscrewing the bolts B, the conical ring F can be withdrawn for cleaning, and any required adjustment can immediately be made.

The Change-speed Gear.

The Argyll gear is so generally known that a detailed description is unnecessary here. The principal features are: The principal gears are always in engagement being brought into operation by means of positive clutches; the operation of the clutches through the medium of a spring in connection with the change-speed lever; the ability to change gears under any circumstances with the greatest ease and certainty. A full description of the gear, with illustrations of this and other details, was given in *The Autocar* of March 7th, 1903, page 287.

The Brakework Mechanism.

The brake drums A are made so that the centre disc forms the hub flange, thus preventing the weakening of the spokes by drilling holes in them for fixing the drum to the wheel. The bands B are made from double sheer spring steel, forming a practically unwearable metal brake. The double-acting movement is obtained by the lever C, which is operated by a hand lever E through the rods F. The compensating action is secured through the bell cranks H.

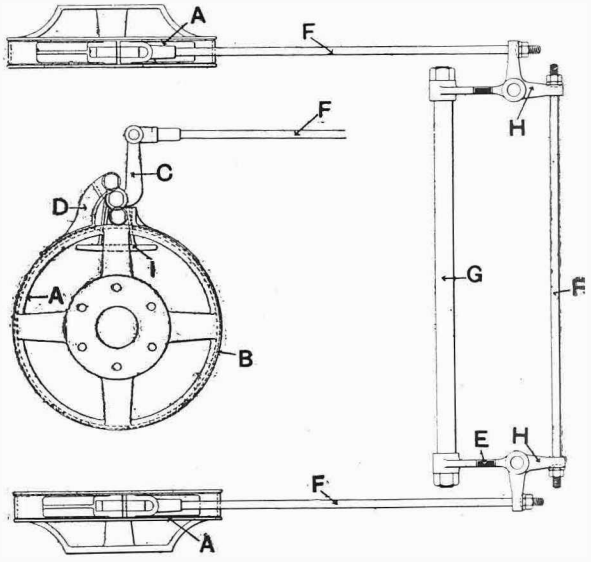


Fig. 5.—Brake mechanism.

A, brake drum
B, brake drum steel bands
C, actuating lever
D, brake band clips
E, brake lever.
F, brake rods
G, brakeshaft
H, compensating bell cranks
I, brake pivot bracket

HORSE ACCIDENTS.

Taking up the record of horse accidents at the point where we laid it down in *The Autocar* of Sept. 19th, 1903, we find that the number of such accidents since then, or rather the number that we have discovered from the newspapers, is 1,262, causing injuries to 927 persons, and the death of 102 others, bringing up the total since we commenced our search on August 29th, 1902, to 5,253 accidents, 3,918 persons injured and 513 killed. This works out at an average of 123.2 accidents per week, with 56.14 persons injured, and 7.35 persons killed, or more than one fatality every day in the year. Extracting the figures for the year just ended we find that they were: Accidents, 3,773; persons injured, 2,745; killed, 315.

We need not repeat what we have said before in regard to the object of these returns, except to say that the compilation of them was commenced at a time when there was a great outcry against autocars on account of their supposed uncontrollability, and the returns were compiled with a view to showing that, although no particular exception is taken to the horse on this score, it is by no means so docile as is popularly supposed. The unconcern with which horse accidents are treated arises really from their frequency, and from the fact that familiarity with them breeds contempt in the public mind, ever on the look out for sensationalism, which these occurrences no longer supply.

The following table shows the weekly details since the beginning of September last:

	No of accidents.	Persons injured.	Persons killed.
Brought forward from *The Autocar* of Sept. 19th, 1903 (p. 371)	3,991	2,991	411
Week ending Sept. 5th	109	76	12
,, ,, ,, 12th	69	46	6
,, ,, ,, 19th	78	69	7
,, ,, ,, 26th	75	66	5
,, ,, Oct. 3rd	69	58	6
,, ,, ,, 10th	64	46	5
,, ,, ,, 17th	78	51	7
,, ,, ,, 24th	69	55	5
,, ,, ,, 31st	67	50	5
,, ,, Nov. 7th	77	52	2
,, ,, ,, 14th	59	37	5
,, ,, ,, 21st	64	49	5
,, ,, ,, 28th	51	31	8
,, ,, Dec. 5th	80	52	7
,, ,, ,, 12th	77	62	5
,, ,, ,, 19th	71	52	4
,, ,, ,, 26th	70	52	4
5 days ending ,, 31st	35	24	4
Totals	5,253	3,918	513

THE PRINCIPLES OF AUTOMATIC CARBURATION.

A TRANSLATION FROM AN ORIGINAL ARTICLE IN FRENCH BY HENRI WALCKER. THIS APPLIES TO CARBURETTERS GENERALLY, THOUGH NATURALLY M. WALCKER HAS SELECTED THAT OF HIS OWN DESIGN FOR THE PURPOSES OF ILLUSTRATION. THIS IS THE CARBURETTER WHICH IS NOW FITTED TO THE CHENARD AND WALCKER CARS.

It might not perhaps be out of place, before describing my carburetter, to consider the few simple laws governing carburation. We will for this purpose confine ourselves to the float-feed spray type. What are the principal components of the modern carburetter? A vessel into which the petrol is drawn by the suction of the motor, and subsequently volatilised and mixed with the air, which, combined in suitable proportions with the spirit, form the explosive mixture. How, then, is the correct proportion of spirit and air to be arrived at—*i.e.*, how is perfect carburation obtained? To commence with, the air inlet is made of larger diameter, whilst the petrol spray is of considerably smaller proportions. When the motor commences to induce the charge of air, this air is bound to draw with it a certain proportion of petrol vapour. It therefore becomes necessary to increase the area of the air passage in ratio to the demands of the engine; otherwise the induction would be literally throttled, and the motor, taking in an insufficient charge for its requirements, would not develop its maximum power, and would, in fact, become an "anæmic engine."

It follows, therefore, that the speed of the air in the carburetter will decrease in proportion to the speed of the engine. As already mentioned, this current of air will absorb a certain quantity of petrol vapour. Let us, for argument's sake, imagine for the moment that we have perfect carburation. What happens if we increase the speed of the motor? It is a well-known fact that carburation must perforce change, and that it will be necessary by means of some device to introduce an additional quantity of air to ensure perfect results. Practice has taught us this.

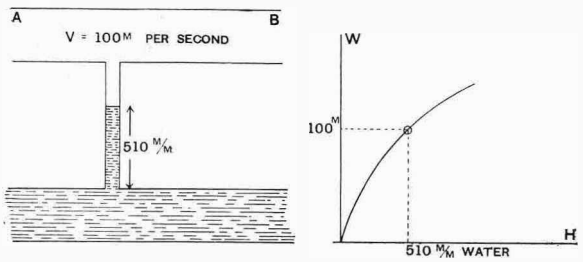
As the motor increases its speed and its suction the pulsations become more intense, and it draws in more rapidly the bulk of air situated at the moment above the valve. The volume becomes more rarefied; its molecules tend to dilate in the same manner as smoke rising from a chimney is affected by the action of the wind; its density decreases. This is what is meant when it is said that the suction (French: *dépression*) increases. But the petrol, which by reason of this increased suction has flowed in a greater proportion, owing to its being a liquid and incapable of compression or expansion, has retained its density. We have consequently too rich a mixture. This is one reason why, if we again desire to establish perfect carburation, it is necessary to introduce an additional quantity of air. But this is not, however, the only reason, for there is a second one, probably of greater importance. This concerns the inertia of the jet of liquid. The petrol motor draws in its charge intermittently. Suction is only one of the four periods which form the complete cycle. After the first period the induction valve closes abruptly, instantly arresting the air current, which impinges against the obstacle barring its progress, without further affecting the working of the motor. But will the petrol cease flowing as abruptly? The answer is obviously in the negative. In consequence of its inertia the spray, which has already attained a certain velocity, and which enters by a different channel from that of the air, whilst differing from the latter in not being closed absolutely by a valve, will continue to flow for a period before gradually stopping, for the static reasons given. We therefore have in each pulsation an excess of petrol, which must be corrected by additional air. The air must be augmented as the speed of the motor increases, since the inertia of the jet will be increased by reason of this extra speed. For precisely the same reasons, if the speed of the motor is decreased, it will be necessary to gradually close the auxiliary air inlet, until it is closed entirely. It will even be necessary to go beyond this, when the motor is running at very low speeds, for a third reason, as follows: Since the petrol is situated at the bottom of a small jet, comparatively shallow, yet of appreciable depth, it results that the current of air must be of sufficient velocity to produce the necessary suction for raising the petrol to the required height.

If it is desired to drive the motor very slowly it will be imperative, for the reasons given above, to diminish, and eventually to entirely close, the auxiliary air supply, in order to maintain the carburation in working proportions. But a time will come eventually when the sectional air passage, which has already been reduced to its minimum, will still be too large to produce sufficient suction to raise the petrol; and then, the motor drawing in nothing but air, the required explosion will not take place. It will therefore be imperative, in order to prevent the motor from stopping, to increase its speed, so as to augment the velocity of the air current, unless another means be available, which may be automatic or controlled by the driver, by which the area of the air passage can be reduced for the purpose of inducing greater suction on the jet.

From the foregoing elementary remarks, which I have endeavoured to make as clear as possible, it will be gathered that perfect carburation—that is to say, the proper dispensation of the explosive mixture—is entirely dependant on the suction produced in the carburetter. If, therefore, it be possible to produce a constant unit of suction, the supply of mixture will be constant, and the carburation will consequently always be perfect.

It will already have been perceived that the suction produced by the motor in the carburetter is continually varying in relation to the speed of the engine. When then is the exact co-efficient at any given speed?

The suction introduces a current of air, which circulates with a certain speed, increasing in proportion as the suction augments. The accompanying curve will show immediately, by means of a simple formula, the value of the suction producing a

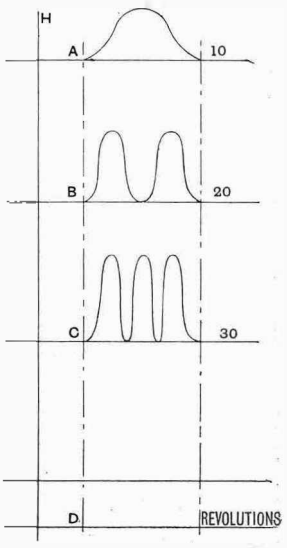


pre-determined current of air. It will thus be seen that a vacuum of 510 mm. of water corresponds to a speed of gas of 100 m. per second or *vice versâ*; that is to say, supposing a current of air passes through the tube A B at a speed of 100 m. per second, the suction which induces it would be sufficient to raise a column of water to a height of 510 mm.

We thus find by means of a simple geometrical rule, and without the aid of any complicated calculations, the speed of air which corresponds to a given suction and *vice versâ*. The speed of the current of air is moreover very easily ascertained, as it is, in fact, equal to the piston speed multiplied by the relation of the piston area to the opening of the carburetter. We shall, therefore, obtain the average suction in the carburetter by the knowledge of the mean speed of the piston, and the mean variation of the suction by the number of revolutions of the motor, which will be represented by a curve similar to the preceding one.

We replace W, the speed of air, by T, the number of revolutions, that is to say, each air speed corresponds to a certain speed of the motor. We shall therefore be able to ascertain the particular suction by the knowledge of the speed of the piston at any given moment. As a matter of fact, at the commencement of the suction stroke the current of air is zero, consequently the suction is zero, and subsequently they cross, until such time as the piston shall have attained its maximum speed, and at that moment they themselves attain their maximum speed. The piston subsequently slows down to zero, the suction is reduced similarly, and the diagram showing this suction is represented by the curve A.

Should the speed of the motor be doubled or trebled, the suction increases proportionately, and the same procedure takes place in periods of half or one-third duration, as shown in curves B and C. It will therefore be immediately apparent that the working of the Chenard and Walcker patent carburetter, embodying the principle of constant suction, will be represented by the plotted diagram, showing a line in the horizontal plane D, instead of by a diagram showing the wave motion, which varies with the speed of the engine.



By this means all carburetter troubles consequent upon varying suction, already explained and hitherto encountered, would appear to be overcome.

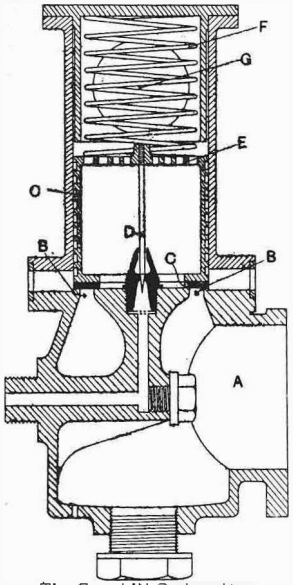
This carburetter might just as well be described as a carburetter ensuring a constant velocity of gas, for the two expressions are connected indissolubly with one another, for a constant suction corresponds to a constant speed. Therefore, in order to effectively employ a variable charge it will obviously be necessary to vary the section of the air passage in exact proportion to the amount of the charge. The speed of the gases, however, will always remain constant. In short, in order not to alter the carburation, the sections of the air and petrol inlets should always remain in the same relation to one another; that is to say, that the section of the petrol inlet should vary proportionately to the

SPECIMENS OF SPANISH ROADS.—It will be remembered a few weeks since when Cormier took the then new 10 h.p. two-cylinder De Dion for its trial tour in Europe and North Africa of 3,880 miles, we mentioned that he had encountered some very bad roads, but how bad they were can best be understood from two photographs taken in Spain, though we believe worse things were encountered in North Africa. The photograph on the left was taken outside Valladolid, and the other near Albacete.

delivery of mixture, since the carburation is always produced under identical conditions. If the motor absorbs two or three times as much mixture the sections of the air and petrol passages must be automatically doubled or trebled, in order to ensure perfect carburation and a constant unit of suction.

Let us see how simply this hitherto unconquered problem is solved. The air inlet is closed by a flat-seated valve, the petrol inlet is mechanically closed by a centrally situated conical needle, the needle is an integral part of the valve and lifts with it, inasmuch as if the air section be doubled by the rising of the valve, the petrol orifice is likewise doubled, and so on. In other words, the relation of the air and petrol orifices to one another always remains the same, in order to ensure the constant carburation, under the influence of the constant vacuum or suction. How then is a constant vacuum or suction obtained? The valve above referred to is always endeavouring to close, under the pressure of a spring, the tension of which is practically constant for all gradations of the lift of the valve. In order that the valve may lift off its seat, it is necessary that the suction should equal the tension of the spring. It will consequently be obvious that if the delivery increases, the suction tends to increase, and exceeds the power of the spring; the valve lifts consequently higher to allow greater passage for the discharge, and automatically decreases the suction of vacuum. The same applies—only inversely—if the delivery is reduced.

Thus it will be seen that the suction is practically constant, whereas in most carburetters it varies frequently, as much as 1 in 10,000, whilst in the Chenard and Walcker the utmost variation has been calculated at from twenty-eight to thirty-two centimetres of water. The obvious advantage of this constant suction or vacuum assures at all times a perfect mixture, for the spray is always produced with the same velocity, the jet always attains the same height (forty centimetres atmospheric pressure), but the diameter of the jet is greater or less according to the demands made by the motor. The impact of this powerful jet against the perforated disc ensures complete atomising, and contributes to perfect pulverisation, especially at very low speeds of the motor. The valve, consequently, literally follows the movement of the piston. It regulates the carburation for all piston speeds during the same suction stroke, it commences to lift off its seat at the moment when the piston commences to draw in a charge, it reaches its maximum lift when the motor attains its maximum piston speed, and closes at the end of the stroke, thus reducing down to zero the diameter of the jet of liquid of which the inertia is nullified, since the closing of the petrol is absolute and simultaneous with that of the air.



The C and W Carburetter.
A, air inlet
B B, annular air passage, closed by the valve C
C, air valve
D, conical needle
E, perforated atomising disc
F, constant tension spring
G, orifice through which the mixture passes into the motor

The accompanying illustration represents the carburetter, of which the level is regulated by an ordinary float.

And now as to the practical result of the adaptation of this carburetter to the well-known Chenard and Walcker motor, fitted with the patented mechanically operated induction valves, which, by means of special cams, already described in *The Autocar*, invariably lift to their fullest extent, but, unlike all other systems, are governed, not according to the amount, but according to the period of their lift.

In consequence of the mixture being, by means of this carburetter, perfect at all times, the engine will give its full power per impulse at all motor speeds, and thus it is possible to run the 18 h.p. Chenard and Walcker car—which is capable of a speed of fifty miles an hour on the level—at two and a half miles per hour through traffic, or, in other words, at a foot pace, without touching the ignition or throttling the engine; and at the same time, within its own length, by merely touching a pedal, the car can be made to travel at anything up to its maximum speed.

The engine is so flexible that it is never necessary to slip the clutch, either for running slowly or turning corners.

If a further proof of the efficiency of this carburetter be required, it may be mentioned that it is possible to drive this car up a steep hill, up which it is capable of driving on the top gear at twenty miles an hour, at any lesser speed at will, by simply altering the position of the cam in relation to the induction valve spindle, which is the only method of governing employed on the car.

The carburetter has no gas or air taps, being entirely automatic, and it is claimed that the engine can always be started from cold by a quarter turn, thus *the existence of the carburetter can at all times be entirely ignored.*

Having no mechanical complications, and depending merely on the laws of nature, there are no parts to wear out and nothing to go wrong.

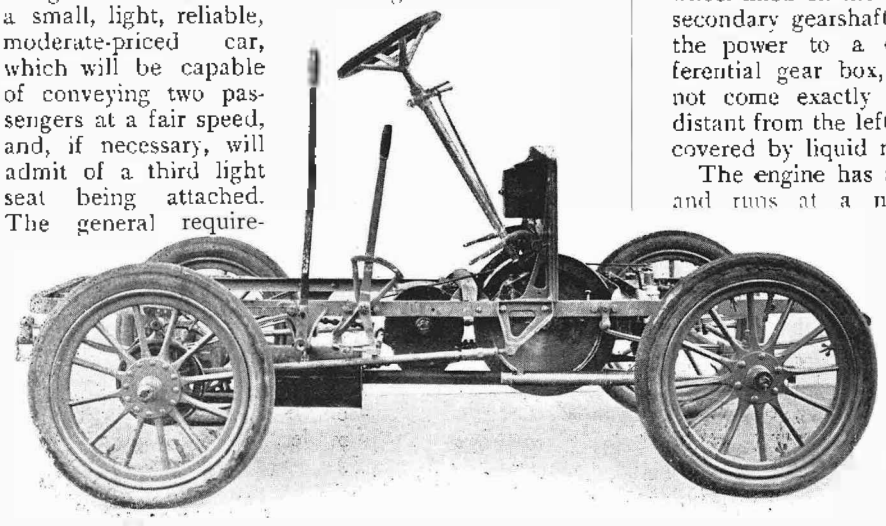
An American inventor claims to have perfected a small battery which, with one charge of a preparation of radium, will run a motor car for three hundred miles. He also claims to have perfected a simple method of extracting the radium from ore.

* * *

Mr. Tudor Owen, of Ash Hall, Cowbridge, had an exciting experience near Shrewsbury last week. He was motoring down St. Mary's Water Lane– a stiff hill near the town—with the intention of calling at a garage. On attempting to steer round a sharp corner into the yard the steering gear went wrong, and the car ran down the hill and over a high wall into the River Severn. Mr. Owen fortunately succeeded in leaping off before the final scene, and was not even slightly injured.

THE NEW 6 H.P. WOLSELEY VOITURETTE.

The well-designed and thoroughly mechanical-looking chassis of which we give a plan and side illustration beneath is that of the new 6 h.p. voiturette which the Wolseley Tool and Motor Car Co., Ltd., of Adderley Park, Birmingham, exhibited in the late Paris Salon. It has been specially designed with the view of meeting the demand for a small, light, reliable, moderate-priced car, which will be capable of conveying two passengers at a fair speed, and, if necessary, will admit of a third light seat being attached. The general requirements of the buyer of a car of this description have been carefully studied, and the smart appearance of the complete car was shown on page 753, Dec. 19th.



Elevation of the 6 h.p. Wolseley chassis.

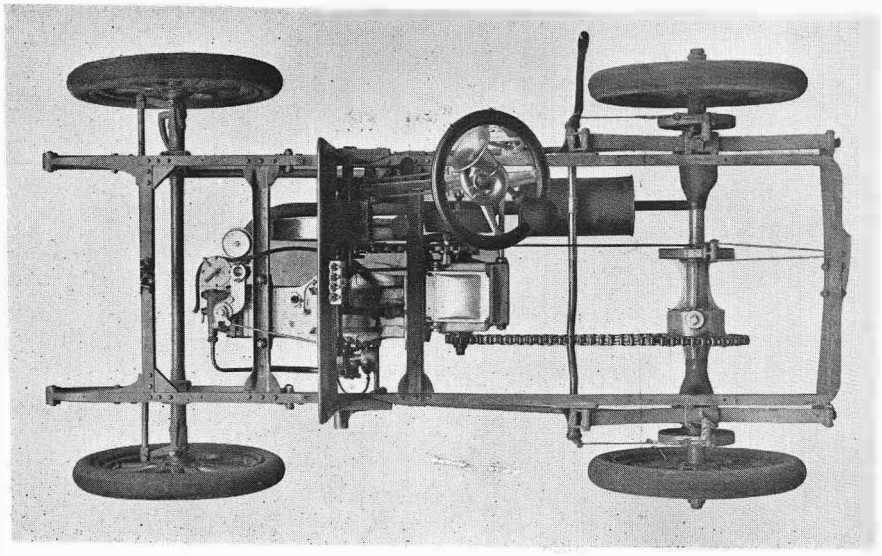
As will be apparent, its design and construction follow, with slight modifications, very much on the lines of its larger predecessors, which the Wolseley Co. have turned out with so much success and in such large numbers. The frame is formed of a single piece of channel steel curved at the rear, and tied together in front by a transverse stay of the same material, the points at which they meet each other being strengthened and stiffened by angle plates.

The engine (a single-cylinder), as is usual in the Wolseley type of car, is suspended horizontally underneath two transverse members of the frame, from which it follows that the crankshaft and countershaft are both parallel to the rear wheel or driven axle to which they communicate their driving power, following in this the ordinary locomotive practice, by which means a considerable loss of power in transmission is avoided, as is the case where the line of driving force has to be turned at right angles by means of bevel gearing.

The transmission is by a Renold chain running from a spur wheel fixed on the crankshaft between the crank case and flywheel (this latter will be observed on the right-hand side of the crank case looking forward) to a spur wheel fixed on one end of the primary gearshaft, thence from a sprocket wheel fixed on the opposite, or left-hand, end of the secondary gearshaft. An ordinary chain transmits the power to a chain ring surrounding the differential gear box, which, it will be noticed, does not come exactly central, though it is sufficiently distant from the left-hand wheel to prevent its being covered by liquid mud which may be splashed up.

The engine has a 4½in. × 5in. bore and stroke, and runs at a normal speed of 800 revolutions per minute, at which rate it gives off a power of 6 b.h.p. No governor is fitted, but the motor is capable of being accelerated to about 1,000 revolutions a minute. The clutch by means of which the engine can be thrown in or out of gear is fixed on an extension of the primary gearshaft, but outside the spur wheel which is attached to the male half of the clutch, which takes up the drive from the crankshaft by means of the Renold chain. The clutch is of the ordinary cone type, actuated by a foot lever.

The gear box (which is attached to the crank chamber in such a manner that an air space for cooling is left between the two) is of the usual Wolseley pattern, containing three speeds and a reverse, the forward speeds being seven, thirteen, and twenty miles per hour normal, the maximum accelerated speed being about twenty-five miles per hour.



Plan of the 6 h.p. Wolseley chassis.

The carburetter is of the usual float feed spray type, controlled by a hand-operated throttle, the petrol being fed to it by gravity. Lubrication is by gravity from a reservoir attached to the dashboard, and fitted with a gauge glass, separate pipes with independent sight feeds leading to all the important bearings.

The brake pedal operates a band brake, this being fixed on the differential box about halfway between the two rear wheels. There are also two equalised brakes acting on drums fixed on the driving wheels; both of these brakes act equally well in either direction. All the springs are semi-elliptic, extra long, a transverse spring being mounted at the back of the car.

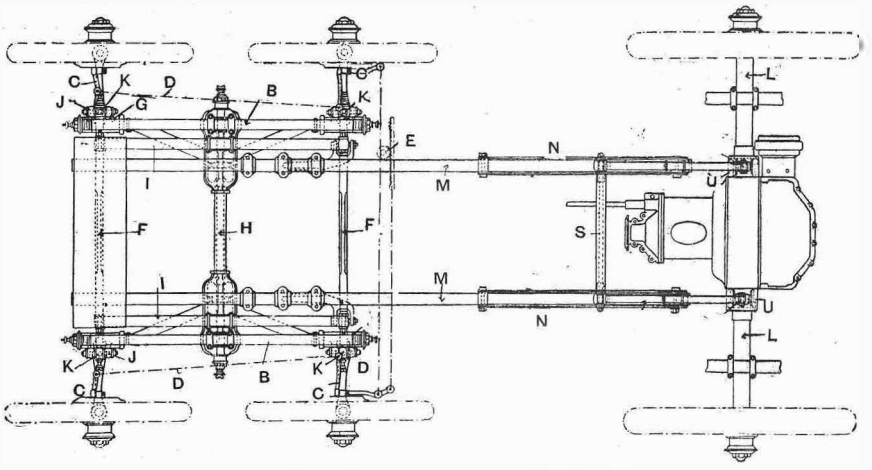
The radiator is of the usual Wolseley type, consisting of copper pipes with brass gills curved round, so as to form the sides and front of the bonnet, the water circulation being maintained by a rotary pump, which obtains its movement from the second speed shaft. The commutator is actuated directly from a worm wheel fixed on the opposite end of the crankshaft to that carrying the flywheel. The ignition is of the usual high tension type, consisting of accumulators and high tension coil, this latter being placed on the dashboard. The wheels are of artillery pattern, 28in. in diameter, fitted with 3in. pneumatic tyres. The wheelbase is 5ft. 6in., and the track 4ft.; total weight, 8½ cwts.

The body has two bucket seats. A large square toolbox, however, is provided at the rear, over which it would be quite feasible to fit an additional or third seat for a child.

The steering is carried out in the usual manner by an inclined column with the ordinary hand wheel. At the lower end of this a pair of bevel wheels transmit the motion by a cardan joint to a worm and quadrant, these latter being fixed to the front axle, so that they have free vertical play according to the irregularities of the road.

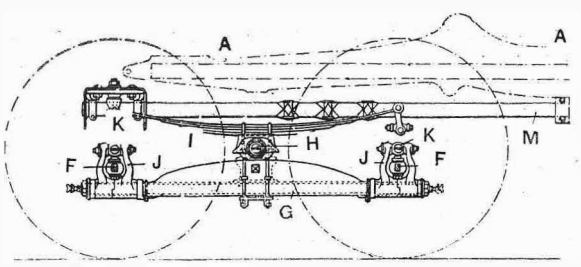
THE FLEXBI BOGIE CAR.

One of the exhibits in the 1903 Paris Salon at which many visitors went to scoff, but from which they returned thinking deeply of its immense possibilities, was the Robin and Janvier six-wheeled car. This we illustrated in our report of the Salon, and the drawings given herewith (which are reproduced from *La Vie Automobile*) will serve to show how the steering of this car is effected. So far as the car itself is concerned, an ordinary chassis is employed with certain modifications. For instance, it will be noticed that the frame proper is considerably narrower than that which is usually employed, though the wheel track is not in any way diminished. Connected to the chassis are two longitudinal semi-elliptical springs I. These carry a fixed axle H at their centre. Connected to this axle are two longitudinal members, as at G, which carry at their ends the axles F F, to which the steering axles C C C C are attached in the usual manner. These steering axles are interconnected and articulated, so that when movement is applied through the steering gear E the four wheels of the bogie turn equally in such a way as to have a common centre in the circle which the car is describing. The axles F F, which are interconnected by the side members G G and attached to the main axle H by a swinging joint, permit of any one of the wheels passing over an obstacle on the road without in any wise affecting the other wheels. An examination of the elevation of the bogie will show the manner in which the axles F F are articulated at J, K K, showing the steering axles proper. In order to permit of the necessary movement between the steering rods, universal joints are employed to allow of the necessary expansion or contraction taking place when passing over obstacles.



Plan of the Robin and Janvier six-wheeled autocar.

A A, framework
B B, front springs
C C C C, steering axles
D D, centre lines of the steering rods
E, steering gear
F F, supplementary axles
G, side member connecting F F
H, main axle
I I, springs
J J, brackets carrying F F
K K K K, connections for C C C C
L L, rear live axle
M M, side members of frame
N N, rear springs
S, transverse member
T T, supplementary spring connection
U U, gear box



The steering bogie of the Robin and Janvier autocar.

CONTINENTAL NOTES AND NEWS.

The Gordon-Bennett Entries.

The French makers have risen splendidly to the call for cars to take part in the eliminating trials. This is the first time that the French champions have been selected from the victors in an eliminating contest, and it is evident that the method of selection is appreciated, as no less than twenty-nine cars by ten different manufacturers have been put in. There are three De Dietrichs, to be driven by Jarrott, Rougier, and Gabriel respectively; three Panhards, drivers De Knyff, M. Farman, and H. Farman; three Bayard-Clément, drivers Weigel, Henriot, and De la Touloubre; three Darracqs, one of which is being driven by Baras; three Mors, drivers Salleron, Léger, and Jeandre; three Richard Brasier cars; three Gobron cars, one driven by Rigolly, of 110 h.p. fame; three Hotchkiss cars (these cars were first seen at the recent Salon), the drivers being given as H. Fournier, A. Fournier, and Vanderbilt; two Turcat Mery cars, and three Gardner-Serpollets, complete the list. The steamers will be driven by the three crack drivers, Le Blon, Pelzer, and Chanliaud.

An Englishman's Comments.

Some of the French automobile constructors are exceedingly wroth at a translation which has been circulated of an article which an English consulting engineer and one of the judges in the recent 1,000 miles trials had written for the *Automobile Club Journal*. While there is no doubt a great deal of truth in some of his contentions with regard to the unnecessary and undesirable complication, the exaggerations in which he indulges and the style in which he writes rob his criticisms of any weight. Had a more dignified tone been adopted, it is possible that some of the French designers, who will now snap their fingers at his criticisms, would have paid a certain amount of attention to them.

Vulgar Criticism.

As a specimen of the style adopted, we quote the longest paragraph in the article: "But the influence of fashion, and the necessity to bow to it when catering with severely technical products for a public very ignorant on the subject, is upon almost all the makers. Some bow reluctantly, refusing to give up a well-tried thing for a new one, or for an alteration which is nothing more, and produces, or secures, no new result. Some are unready, and have adopted changes such as pressed frames before they have altered the designs of connections to suit. Many have attempted to meet the claims of fashion and faddist until their cars have become variety shows in themselves. They have pressed frames with incongruous fittings, badly-designed spring hangers riveted into their ends, or outrigger hangers stuck on the side and fastened by three small rivets in the 5-32in. plate forming the pressed frame, bad corner joints, and no provision for racking stresses. They have discarded accessible automatic inlet valves for inaccessible valves operated by chattering mechanism, half of which is sealed up beyond inspection, except by taking the whole engine and everything attached to it to pieces. They have low-tension magneto ignition apparatus with sufficient parts for a typewriter, and some of them supplement these with an ordinary high-tension jump spark set of apparatus, so as to be sure they may have enough; many of them have added some form of rotary make and break, driven by separate little spindles and bevel gear, or by a chain and sprocket wheels and numerous bearings, apparently because the thing will not work except under observation on the dashboard; they have clutch apparatus, with spring adjustment apparatus, ball thrusts, and parts enough to please a German high school valve gear designer and to spare; they have lubricators enough to fill a store, and most of them are using, in addition, one with wheels going round to please Toddy, and big enough for a decently-behaved and not too thirsty engine of five times the size; gear boxes have grown in size and number of wheels, and operating spindles and forks, and one has not enough parts inside, so, like a Dutch clock, with its guts hanging down the wall, this has a pair of entrail-looking slotted links, and radius rods and connections hanging out in the dust. The same car has numerous wire connections to carburetter and ignition tackle, and the observer is awed at the ingenuity displayed in the compilation of this car, but wonders why, after having fairly got away on the principle of compilation by addition, the designer did not put it in the hands of the accessory makers in the gallery for further developments."

The French Rejoinder.

Now, there is a great deal of truth in the above criticism, but it is felt that it is written with bias, particularly as Mr. Beaumont concludes by saying that there were very few cars in the exhibition which he would accept for his own use if he wanted one, and the French makers naturally want to know what this critic really knows about the subject, and whether he has owned any of the cars that he condemns. They also remind him of the express engines on the Nord Railway, which used to be sneered at because they looked complicated, but which, nevertheless, are beating the best English running every day of the week between Paris and Calais. In other words, these so-called complex machines are hauling loads at speeds which no English locomotive has ever equalled. On the other hand, Colonel Crompton's criticisms, which appear in the same issue of the *Club Journal*, are read with interest and respect, as no attempt is made at vulgar sarcasm, and they are recognised as the opinions of a practical level-headed engineer.

Industrial Cars.

In proposing the awards for the late heavy car trials in Paris, the president of the technical commission, M. G. Forestier, said that there was very little hope of continuing to carry out these tests on the lines upon which they had been organised in the past. For some reason or another makers have been taking a diminishing interest in the trials. It is possible that they may be of too scientific a character. They are held under conditions that do not interest the public, who understand nothing of the formulæ by which the performances of the cars are represented, and being vaguely conscious that

the trials are a little above them, they leave everything to the organisers and observers who go about their work in an atmosphere of utter indifference. Under ordinary circumstances the absence of public interest would matter little if the trials attracted some attention from possible users, who may be induced by the performances of the vehicles and their economy to employ them for transport, but in the present state of affairs tradespeople and others are, as a body, so little disposed to go into the question of automobile traction, that the only way of arousing interest is by carrying out a work of propaganda. The makers will certainly not go to the expense of running vans, lorries, and omnibuses in trials where they fail to attract the attention of possible users. Therefore, the only thing to be done is to impress the public generally by a novel display, so that those who are capable of using big vehicles will begin to think that they are really making good progress, and will, consequently, be tempted into examining the reliability and economy of the cars. This interest must extend over as large an area as possible, embracing a vast population from which customers may be drawn. The trials must serve as a publicity, at the same time that they preserve their scientific character. For this reason, it is proposed next year to organise the trials over a sort of circuit. A number of towns will be visited by the cars which will run over a course in each of them, bringing up the total distance of the circuit to about 1,200 kilometres. The idea is a good one, for instead of the trials being run off before a public who have grown indifferent on account of their monotony, they will be witnessed by a fresh public each day. Never having probably seen anything of the kind before, the populations of the different towns will welcome the cars on their arrival from a long journey with enthusiasm, and the trial run in their own streets will be watched with the greatest interest. After what we saw of the excitement caused by the industrial vehicles last year in their run from Paris to Monte Carlo we have not the slightest doubt that the experiment will prove a success, the more so as the makers themselves are hardly likely to lose this opportunity of making their vehicles known in the provinces where the conditions are specially suitable for the economical employment of heavy motor vehicles.

An incident lately occurred in Paris which illustrates the utility of the autocar as an aid to the police. M. Aubry, the author, was driving his motor car down the Rue Reaumur when the cry of "Stop thief" arrested his attention, and at the request of those in chase he took on board the chief pursuer, and was the means of capturing an escaping burglar, who was thereupon handed over to the police.

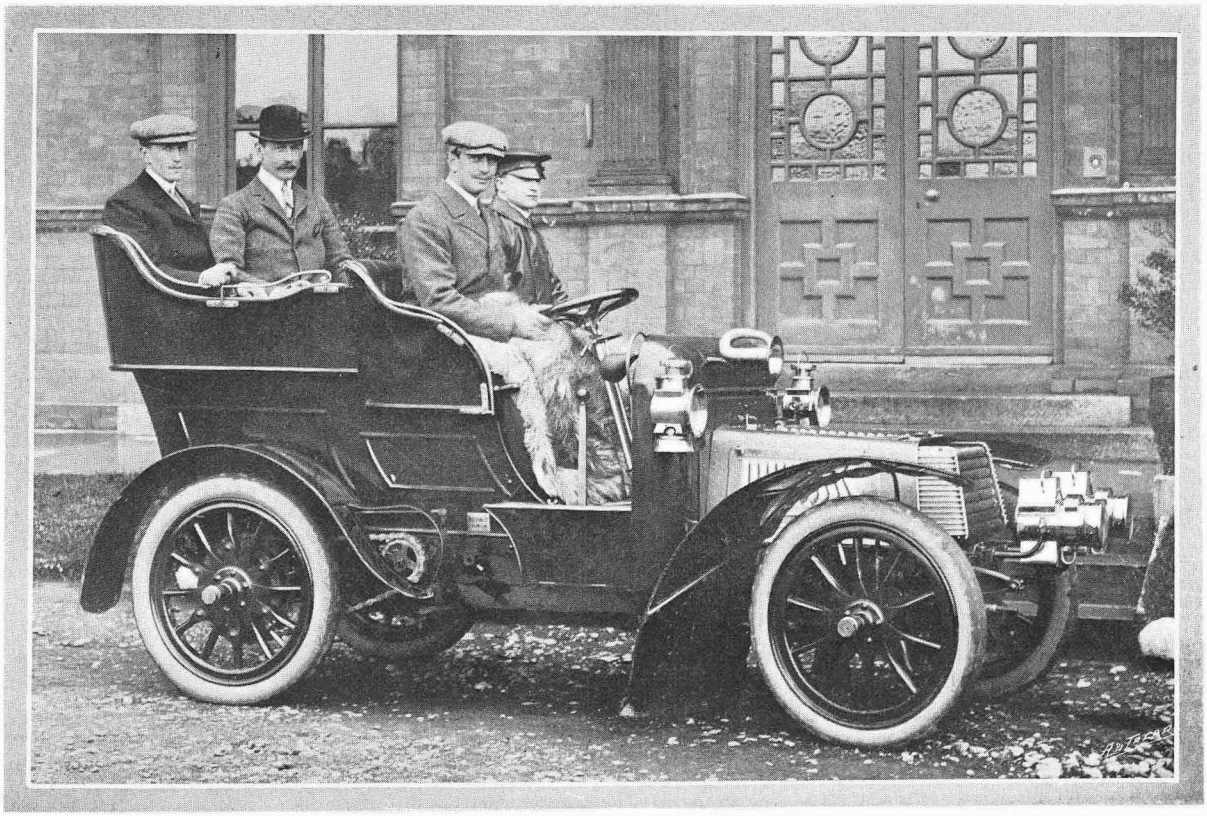


Photo. *Lafayette.*

Mr P. Kirr Smiley, of the 21st Lancers, at the wheel of his 14 h.p. Daimler, which was supplied to him by Hutton and Sons, of Dublin, who have taken such a hold upon the Irish automobile world. The photograph from which our illustration is reproduced was taken in front of the Marlborough Barracks, Dublin, which the 21st are to vacate shortly. This car is very popular with the officers of the Queen's Own, and is generally in great request.

Correspondence.

The Editor is not responsible for the opinions of his correspondents.

MOTOR MOUNTAINEERING.

[3424.]—We have received a letter from Mr. J. Todd, of Bromfield, Cumberland, enclosing the gradients of the stiffest portions of his climb over Honister Pass with his 10 h.p. car, an account of which you will remember publishing a few weeks ago. The gradients are as follows:

Honister ascent, 1 in 3¾ (stiffest part).
Honister descent, 1 in 3½.
Buttermere Hause ascent, 1 in 4½.
Buttermere Hause descent, 1 in 4.

Quoting from Mr. Todd's letter: "I may say that I 'took' the gradients with a straight-edge 8ft. long with spirit level mounted on a hinge in the middle as indicated in the sketch. The under half is carefully marked in inches. The upper half is kept up at the level with a piece of thin

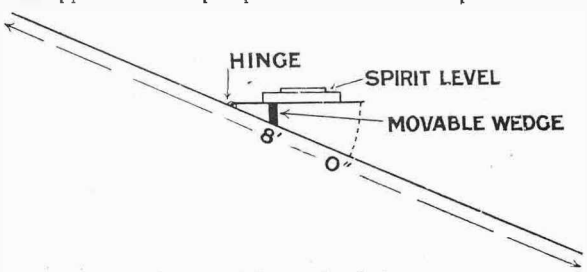


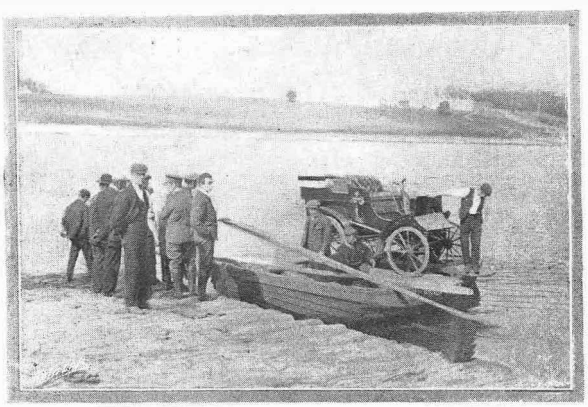
diagram of the grading instrument.

wood exactly 1in. wide, which is moved up until the level is reached. The four ascents and descents mentioned are the steepest I could find on each. The ascents could not be rushed, as, in the case of Honister climb, it was a stiff climb of at least half a mile, and in the Buttermere ascent the climb was at least a mile and a quarter before getting to the stiffest place, so that in each case the engine was running very slowly." H. AUSTIN,

The Wolseley Tool and Motor Co., Ltd.

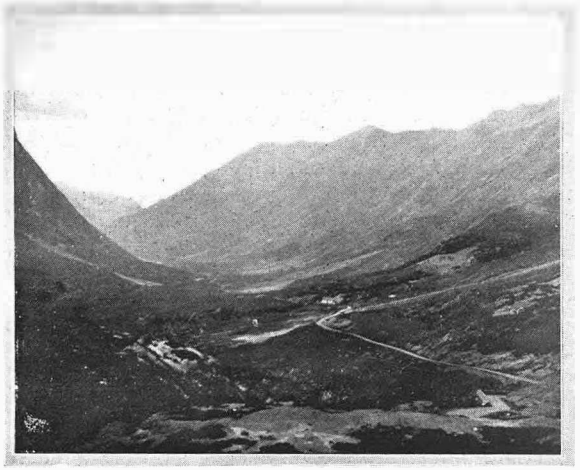
P.S.—This was not a special car or specially geared.

[3425.]—Seeing an article in a recent issue of the journal of the Scottish mountaineering club on "Mountaineering with a Motor Car," in which it was stated that the ferry at Loch Leven, Ballachulish, Scotland, was not suitable for conveying motor cars across the loch, or words to that effect, I have pleasure in enclosing you a photograph of a car mounted on the ferry boat preparatory to setting out for the other side. This photograph was taken during a tour, which I had the pleasure of making with



The ferry at Ballachulish, Loch Leven

other members of my family in July of this year, but the tour was a short one, lasting five days, and our route was as follows, viz.: First day, Glasgow to Tyndrum: second day, Tyndrum to Bridge of Orchy, successfully crossing the Ballachulish ferry on the way; third day, Bridge of Orchy to Dalwhinnie, *viâ* Caledonian Canal and Inverness; fourth day, Dalwhinnie to Killin, *viâ* Ballinluig and Kenmore, where, spending the night, we reached home next evening, having spent the forenoon of the fifth day in fishing Loch Tay. We had magnificent weather all the time, and our



The road through Glen Coe.

little car—an 8 h.p. Albion—ran the whole time without any adjustments whatever having to be made. The distance is a little over 330 miles. We found our solid tyres a great advantage in descending places like Glen Co. where the roads are covered with very sharp stones, which soon play havoc with one's tyres. I also enclose a photograph of Glen Coe taken from the top.

Pittsburg, Pa. WM. DRYSDALE.

BACK AXLES.

[3426.]—I should be glad if some of your expert readers would offer their opinion on the construction of back axles. The axle of my car, built by a well-known English company, recently broke through the collapse of the ball race at the offside end of the axle, perhaps due to the breaking of one or more of the balls. It gave no warning whatever. Being quite alive to the danger, I had only recently looked at the axle and fixings.

The makers tell me that they have now abandoned ball bearings at the outer ends of axles in favour of plain bearings.

I am now looking for another car, but find that nearly all have some kind of ball bearings for the outer ends of axles, with the construction of which the would-be vendor's agents—who, of course, have no experience such as mine—seem imperfectly acquainted. They refer to the 1,000 miles tests, etc. This is far from satisfactory, for the danger is scarcely likely to occur with so short a test, and in the matter of axles a car should be good for 100,000 miles. It is the possibility of such dangers which have to be considered, not whether a certain number of cars have successfully braved them.

I believe the De Dion Company abandoned outer ball bearings years ago, and the makers of the Oldsmobile, and I daresay other makers do not use them.

I lately inspected an eminent French make of car with a live back axle which had to carry a car weighing fully a ton on one row of balls. The Wolseley Company, I understand, fix two or three rows of balls.

I believe ball bearings for railway carriages were tried and abandoned years ago, though, if successful, it would scarcely have been necessary to increase the power of the locomotives to the enormous extent now common.

Sitting on a weak back axle is worse than on 200 lbs. of steam—a favourite "put off" of vendors of petrol cars. It seems to me that if ball bearings are used, that part of the axle which runs on them should have a boss much thicker than the other part of the shaft, or the live axle should run in a thick sleeve, which sleeve should be in contact with the balls and race, and not the axle.

I am determined to avoid an increase in statistics of motor accidents for the instruction of motor manufacturers, and that the next car I possess shall have no known vice of construction which may involve a capsize and an extinguishment of G.E.

TYRES IN THE 1,000 MILES TRIALS.

[3427.]—Mr. Harry Lupton makes a very sweeping statement in your last issue, to the effect that there is no pneumatic tyre on the market which is worth its weight in straw to a business or professional man.

According to my my experience, pneumatic tyres properly treated give very little trouble. I have run a set (which includes two spare covers) on a 10-12 h.p. Siddeley car since the beginning of April, and much of my driving has been done on roads plentifully bestrewn with loose stones. During that period I have had one genuine puncture, and I had an air tube burst in the same tyre shortly afterwards, due to the butterfly nuts of the bolts not having been screwed up a second time after the cover had been replaced and the bolts had settled down.

A puncture will not, as a rule, cause more than half an hour's delay, which is less than would be incurred should a horse shed a shoe, an event of comparatively common occurrence. The inconvenience is intensified in the case of the horse, for with a pneumatic tyred car the lost time can be made up, but with the horse this cannot be done. I personally know several doctors who are using motor cars for their professional work, and I have not heard them complain of their pneumatic tyres.

R. J. MECREDY.

MOTOR VEHICLE v. HORSE.

[3428.]—There is an error in T. Blamey's letter, "Motor vehicle v. horse." The cab (cob?), fodder, etc., must be cut down to £20 or the five years' fodder will be £275, which is £25 against the noble quad. V.S.W.

[3429.]—Referring to the correspondence which is now appearing in your paper on the subject of motor vehicles v. horses, there appears to be a good deal of guess work about the cost of keeping a car.

I have kept very accurate accounts of the cost of running my car for two years seven months and a daily record of the miles run, so that I believe the following figures might be of some interest and would form a guide for estimating the cost of a larger car.

My car is a 4½ h.p. De Dion which will carry four, and very often does; it weighs 9 cwts. For the first few months the cost of tyres was heavy, for as then made they were too light. The Dunlops I have on now are very good. One has done 3,544 miles without a puncture.

The car runs now as well as ever, and always has been most reliable. I look after it myself and do all my own repairs. Owing to the change in fashion of cars, the depreciation must be heavy, but think I might put the present value at £120, considering its good condition.

COST OF RUNNING A CAR FOR TWO YEARS SEVEN MONTHS.

	£	s.	d.
Cost of car	245	0	0
Pneumatic tyres	77	4	11
Fittings, spare, and renewals	18	3	5
Lubricating oil	2	4	3
467 gallons of petrol	35	8	11
License and insurance	10	1	0
	388	2	6
Sale of car	120	0	0
	£268	2	6

Miles run, 10,264. This is about 6¼d. per mile.

WILLIAMS

[3430.]—Observing the correspondence in *The Autocar* regarding relative cost of horses as against motors, if you consider my experience worth recording, perhaps you will insert this note in your excellent paper. I hope you consider that all sides should be heard. I have kept horses all my life; I have now one pair that have worked well for ten years, and, beyond being a bit groggy and stiff, seem likely to work well for some years again. Beyond their food, etc., I have had no expense with them worth mentioning. Now as regards motors. Three months ago I invested in a sound, simple car from a Coventry firm, the engine being a 9 h.p. single-cylinder De Dion. My experiences have been really amusing. First I was run down from Coventry to where I live in first-rate style, but my troubles began in two days' time, and from then till to-day I have never got her to run two miles without trouble. I never attempt to go further than ten miles from home, as I find having to walk home in the dark beyond that distance a bit tedious. I have had engineers down; I have sent to engineers' works time after time, the result invariably the same. As soon as the engineer's back is turned the motor begins, back fires, misfires, loses compression, fails to start, fires into silencer, etc. I have tried new wiring, wet batteries, dry batteries, trembler coils, spark accentuators—in fact, most new toys, all to no purpose. Now, the curious part of it all is that there is nothing and never has been anything wrong with car in engine, or gear. But you will say I must know nothing about cars. Here again I suggest I ought to know a little, as I have had three motor cycles through my hands, and so am not altogether a novice. To come back to the point *re* relative cost of horse and motor, I reckon that in three months I have just managed to scratch 100 miles out of the car, and if I am fortunate enough to get rid of it at the price I am asking, I reckon those 100 miles of pleasure will have cost me £1 5s. per mile. The cost per mile of my horses I leave readers to estimate. Fortunately, I am a man of leisure, so I do not charge for time in the above estimate. WELSHMAN.

THE KREBS AND NAPIER CARBURETTERS.

[3431.]—In his letter (3221, Oct. 17th), Mr. C. T. Riddalls states that the Krebs carburetter absorbs approximately 1-12 of the engine power, and he proceeds to formulate a "proof." I am surprised that no one has pointed out the fallacy of this "proof," and have been hindered from doing so myself by pressure of work.

Mr. Riddalls falls into the old error of the imaginary force suction. The Krebs is actuated by air pressure, and while the force upon the plunger (due to difference of pressure) depends upon the degree of vacuum produced by the suction stroke, the actual cause is atmospheric pressure, which virtually acts as an independent spring.

Perhaps an analogy will elucidate this point to those not acquainted with the subject. Imagine two persons each pressing upon the opposite sides of a door; while they press equally the door remains stationary; but if one of them reduces his pressure the door will move in his direction. The impelling force, while depending upon the difference of pressure of the two persons, is *caused* by the person on the other side.

To split hairs, the Napier carburetter actually absorbs more power than the Krebs, since the diaphragm is actuated by a pressure produced primarily in the motor. Both carburetters are no doubt excellent, but the Napier has a greater liability to be thrown out of adjustment on account of water leakage and pump choking.

NORMAN WELLS.

TO SEND A CAR INTO FRANCE.

[3432.]—In response to one of your readers, who signs himself B.W.V., I should like to inform him how to send a French car into France with the least amount of inconvenience.

In the first place, he must ask the manufacturer of the car for what is called an *extrait du livre*, which is a duplicate of the entries in his books—namely, when the car was made, when sold, when delivered, its value, etc. Secondly, to get the stamped paper upon which the particulars are drawn up signed by the commissary of police; and, lastly, to send this document with the declaration form to the custom house where the car is detained.

At the beginning of last year I bought a Darracq car in Paris, and had it sent to London without any difficulty whatever. Six months later, when I went for my holidays, I took it with me, and had to go through all the needless formalities and trivialities with the officials at the Boulogne Custom House. Although various parts of the machine bore the stamp "Darracq, Paris," and I was furnished with an *extrait du livre*, I had a lot of trouble in convincing them that the car was entirely French.

Your correspondent may find this strange, but I can assure him that there are even stranger things than that in France. Over there they seem to do all they possibly can to prevent business from being done.

F. TROUVE.

SOLID TYRES.

[3433.]—I should like to supply my item of evidence in this controversy. I have driven my 7½ h.p. Wolseley for nine months on pneumatic tyres of first-class make. I look back to many pleasant runs, but also to some which culminated in a punctured or a burst tyre in a remote spot with three hungry people saying, "Can't you take us home and mend the thing there?" They invariably got their dinner and I—a bill for tyre repairs or a new tyre. In fact, motoring around Sheffield on our bad roads with pneumatic driving tyres is like walking with bare feet with the risk of stepping on a tin tack. The risk is not great perhaps, but it considerably mars one's enjoyment of the exercise. I have now driving wheels with 2½in. Royal Buffer solids, and cannot conceive of desiring pneumatics again. If Mr. Strickland means that the pneumatic *as now made* will beat the solid tyre *as now made* for the driving wheels of ordinary touring cars, I entirely disagree. Mr. McCormack seems to imply that any man who thinks a solid tyre can adequately replace a pneumatic is either a manufacturer of solid tyres or a friend bent on misleading your "innocent confiding readers." ONE OF THEM

[3434.]—I don't think Mr. Strickland could have fully considered the tyre question, or he would not have compared the use of a bicycle tyre with a motor car tyre. In one case, every pound makes a great difference to the rider; consequently, solid tyres were small as compared with pneumatics on bicycles, and one could not expect to get the same comfort as could be obtained from a large pneumatic tyre out of a 3in. solid tyre, which was the size generally used in the days of solids when saddles were bad and bicycles were clumsy and weighed nearly three times as much as they now do.

With motor cars it is different. The engines are capable of propelling (without fatigue to the rider) the car fitted with large solid tyres and suitable springs. Most English cars, and a number of foreign cars, are now suitably sprung for solids, and as the public require such cars, there is no reason why they should not all be properly sprung. With large solid tyres and good springs, the vibration, even at speeds over thirty miles an hour (which is greatly in excess of the new legal limit), is almost completely absorbed before it reaches the frame of the car, and in the case of pneumatics—which are usually run with an air pressure of fifty pounds to the square inch instead of about double that pressure as they should have—these tyres absorb the vibration but cause a lot of power to be wasted by driving on a flexible ring round a wheel. If pneumatic tyres were pumped sufficiently hard by the average user they would not absorb the vibration so freely, but would give a more direct drive and last longer, for the action of a pneumatic tyre not sufficiently inflated is to form two hinges which work backwards and forwards each time the wheel revolves, which is about six times a second on an ordinary touring car, and the canvas casing (or cords) which form the wall will only bend backwards and forwards a reasonable number of times before it gives way and possibly causes an accident by the tyre bursting, which with the front wheel means that the steering of a car, or possibly the car itself, is upset. This strain on the tyre is greatly increased by the swaying of the car on pneumatic tyres, especially when twisting or turning.

A properly constructed solid tyre on a well sprung car is equally as comfortable as a pneumatic, except at racing speeds or on exceptionally bad roads, where the car jumps from the road continually and bounces along. Then, only, is a properly constructed solid rubber tyre too slow in its action of displacement and recovery over such obstacles, and under such exceptional circumstances nothing but a highly inflated pneumatic tyre will act quickly enough in itself to prevent a rough jar. Therefore, it is not surprising to find that one's 10 h.p. car and 6 h.p. voiturette fitted with Buffer solid tyres on all four wheels are as comfortable as pneumatic-tyred cars, except on extraordinarily bad roads, and these solid-tyred cars can beat similar cars shod with pneumatic tyres on the hills.

There is no doubt that the smoother the track or road, and the harder the tyre is, the better; for not only does a flexible tyre waste power in transmission, but the more flexible it is, and the greater the weight of the vehicle, the greater the obstruction formed by the tyre itself in front of the place in contact with the road, so that when the car is progressing, the most flexible tyre forms the greatest wave against which the wheel has to continually push.

Bicycle tyres are not always reliable, although the weight of the bicycle and the driving strains on the tyre are only about one hundredth or a two hundredth part of the strain put upon a motor car tyre.

It is the great danger and uncertainty about a pneumatic tyre, quite regardless of the enormous expense (which is about ten times the cost of maintenance of a good solid tyre), that is driving the public so quickly to solid tyres X.Y.Z.

[3435.]—I am much obliged to Mr. Joseph Taylor for recommending a particular make of tyre.

The Sirdar Company's tyres—one of which began to lift—evidently did not come up to expectations. The ——— Co., from whom I purchased my 9 h.p. car in 1902, told me that the Sirdar Rubber Co. know perfectly well what the weight of their 9 h.p. car was with body. The Sirdar Co. would not have been so foolish as to put what they imagined to be too light a tyre on a car, but the fact is that at the date they put 2½in. tyres on every car and did not supply 3in. So the motor car company told me. I know of cases where extremely heavy cars have been run quite successfully on 2½in. tyres. As I said in my previous letter, I had had no trouble with 2½in. Clinchers or Connolly's wired-on tyres, but I suppose I fell into the mistake of thinking, because a firm widely advertises, that therefore its goods are better than those of more reticent tradesmen. My car develops 20 m.p.h. only when being pushed. I should say at its heaviest, viz., with top on, it does about 14 m.p.h. That is on good ground only. I should be glad to have further particulars as to the running of cars of one ton or over on 2½in. solid rubber tyres, with the name of the tyre makers. A BELIEVER IN SOLID TYRES.

P.S.—I see a letter about pneumatic tyres on bicycles. I first rode a pneumatic tyre in 1890 or 1891. I consider these tyres are not improved one bit since then, except to a slight extent as regards skidding. They puncture quite as easily.

NON-SKIDDING TREADS.

[3436.]—In reply to 3414, I have had the Samson-Hutchinson treads fitted to the driving wheels of my 16 h.p. De Dietrich. These treads certainly prevent side-slip. I have driven my car about 350 miles on greasy roads with these treads and have had no suspicion of a slip. They show no signs of wear at present, but of course it is impossible to give a definite opinion on the question of their durability without further trial. They do not in any way affect the smooth running of the car, but I think they slow it down a little. This latter point is not a serious matter, and is amply made up for by the extra driving grip obtained on greasy roads.
MACAULAY MORT.

[3437.]—Referring to letter No. 3377 in your issue of the 26th ult., wherein your correspondent, while fully admitting that the Perfecta bands effectually prevent side-slip states that the straps have cut the tyres on his car, will you kindly allow us to explain that he had one of the first pairs of bands used in this country, and that the pattern has since been very materially improved.

At the same time we would point out that even with the old pattern we have never known any damage to the tyre occasioned by the bands when properly fitted.

With regard to the last paragraph, the general opinion is that the power is increased in hill work, especially on greasy roads. H. M. HOBSON, LTD.

AN APPEAL TO CORRESPONDENTS.

[3438.]—It was with dismay I read some of the correspondence in my *Autocar* of the 2nd inst. Not only is advertisement freely indulged in, but the airing of personal differences and the "washing of dirty linen" is displayed *ad lib.*

Let us appeal to the better feelings of some of your otherwise estimable correspondents, and entreat them to study the feelings of your readers in at least some small degree.

A great deal can be learnt by reading the opinions and experiences of the bulk of your correspondents, but I will venture to wager that in the opinion of many of your readers the tone and nature of some of the letters of late are anything but edifying. To debate on the question of principle is good for us all, but to indulge in a lot of uninteresting piffle is taking a mean advantage of the privilege you accord your readers by placing certain columns at their disposal for the discussion of subjects of public interest. W. J. McCORMACK.

NUMBERING.

[3439.]—If the new Act, with its offensive provision of numbering, is used in a tyrannous manner, I suggest a method of circumscribing its activity. A number is to be displayed. As far as I know there is no power to forbid the display of more than one number. Let the official number be surrounded by a galaxy of other numbers all similar to it. Let the inquisitive select which they please when acting as informers. When the car is standing selection will be a sporting operation, and when the car is moving the effect will be kaleidoscopic.

BERTRAM BLOUNT.

[While it should be clearly recognised that our correspondent only suggests a remedy in any district where the numbering is taken advantage of by the authorities in a tyrannous manner, we do not recommend anyone to put the suggestion into practice even if they should happen to reside in an anti-motor district, because the Act places upon the owner of the car the obligation to see that his identification mark is so fixed that "it is in no way obscured or rendered or allowed to become not easily distinguishable." The affixing of several numbers would doubtless be regarded by the authorities as an attempt to prevent the official registered number from being "easily distinguishable." To attempt to argue that the official number is not rendered easily distinguishable would be futile. The words of the Act—"if the mark is in any way rendered not easily distinguishable"—would be clearly violated, and the motorist would therefore find himself out of court, and subjected to a penalty not exceeding £20 for the first offence. This is a serious matter in more ways than one, as the second and subsequent offences not only provide £50 maximum fine, but imprisonment at the discretion of the court.—ED.]

THE MOTOR GADABOUT.

[3440.]—Allow me through the medium of your most useful newspaper to thank 3366, Marine Engineer, for his nice letter anent the Vauxhall—a car which I am quite a believer in. I have had some rides in it, but what is its weight? And does it carry magneto or electric ignition? In a country where we are forty miles from a charging station electric ignition is not altogether desirable. With this exception, I prefer the little Oldsmobile to all the gadabouts I have seen or tried. But could anyone tell me about the Beeston Humberette (£140)? Is it as good as the Beeston Humber bicycle, which I used to ride with such pleasure in early days? Is it a quite perfect hill-climber? That is an absolute necessity for me on my bonny Highland hills. From its pictures it looks heavy, and what is its ignition? I have quite determined to have solid tyres.

The price has a great deal to do with the demand for a small motor car. In all things, though we are inclined to keep it up our sleeve, the price is the crucial test of what we buy.

But there are other things which influence us, and we must not allow ourselves to be led away by the subtle manner in which makers and agents talk of those things when trying to persuade the customers to decide in purchasing what they do not altogether care to have. It is true that in one respect at least—namely, in the engines—there is very little if, indeed, any difference in cost of construction between a large and a small engine when both are made with equal care, and of equally good material and with the full complement of improvements in both, but in the coachwork we shall find considerable difference. The wheels cost much more in a large than a small car, including the tyres, and as for the bodies, what is the difference in price between a pony chaise or a governess cart and brougham or landau? Really, the cost of a motor car rests with the coachbuilder: not the engineer.

Irrespective of price, probably the majority of men would reason with themselves something in this way: "At first I should like to possess a little light toy, but serviceable, that I can, with the help of the gardener's boy easily manage, and be quite easy to push about. I will drive it slowly and carefully about the door until I have mastered it completely and, what is of equal importance, until the neighbours have got accustomed to it and are no longer frightened of it. Other people have accidents. Why should I have an immunity? Then if an accident happens to my little light pony chaise the damage will not be so great as with a large, heavy car, nor will it be so costly. But when I and my man have become experts, and my neighbours and servants have become used to these things, fully acquainted with their construction and mechanism, and both of us experts in driving and steering, then I may fairly embark in a larger, more powerful, and more costly car that can carry five or six people, and at least do station work. Then I shall be able to dispose of at least one of my carriages and perhaps two or three of the prancing horses which now occupy stalls in my stable, and at least one stable man." These are my views, and I hope, through your aid, Mr. Editor, some day to carry them out.

AN OLD CYCLIST.

STEAM CAR DIFFICULTIES IN CAPE COLONY.

[3441.]—It seems from the correspondence in *The Autocar* on the subject of steam cars that there are many amateur mechanics who, like myself, own such cars, but who find it very difficult to get reliable, practical information about the different parts and the method of using them. I have most of the books that are advertised, but find a very small part devoted to steam cars, and what there is is mainly a list of the component parts of the various patents without any working details. What is wanted is a book giving experiences and practical details of the different type of burners, boilers, engines, condensers, etc., and how to locate the causes of bad working of these parts, which do not always act exactly as they should according to theory and makers' claims.

What to do in emergencies and special conditions (road, weather, etc.), and how to do it, is given in detail for internal combustion engines, but the poor steamer is ignored, and for up country colonial work such as this, steam in my humble opinion is certainly more suitable. I have a paraffin burner which burns well when once alight, but the other day with a strong following wind it backfired, and I had to get my companion to protect the ventilator with his coat all the way. A practical man would have been able to tell me that ventilators with only two ends opening sideways were useless under such circumstances. At another time in the middle of the veldt I had to put my fire out, and when I wanted to relight the wind was blowing strongly, and I had the utmost difficulty in relighting the torch and then the pilot light. My boiler is a 16in. fire tube, and the engine is an ordinary two-cylinder one, but I cannot manage to do what one reads about where people start with, say, a pressure of 250 lbs. at the bottom of a hill of perhaps one in ten gradient and when they get to the top they have 300 lbs. There are lots of hills here with average gradients of one in ten and about a mile long, but I find my pressure rapidly decreases from 250 lbs. to 150 lbs., and then the engine stops and I have to wait about half-way. There are a lot of other faults one discovers that to a novice appear due to the machine, but probably are due to his want of proper knowledge, which he has no means of obtaining. W. E. K

Victoria East, Cape Colony.

"Darracq" is anxious to know if any private users will be good enough to give him their experiences with the 8 h.p. Darracq. He says: "I particularly want to be assured of its hill-climbing powers before deciding; also that it is a soundly built and reliable car. I want a car that will take a reasonable hill (say one an average cyclist can ride up) on the second speed with four up at about ten miles per hour."

[Too late for insertion this week, we have received two letters—one from Mr. D. M. Weigel on "French Overproduction," and another from Mr. Henwood on the "Rubber Cushion Hub." These and other letters are held over till another issue.—ED.]

Flashes.

It is said that no motor car owner in Shropshire will consent to be labelled No. 13. Two have refused to accept the fateful figure, and "No. 13" is now cancelled so far as Shropshire is concerned.

* * *

No less than fourteen English cars are entered to the Automobile Club for the eliminating race which will be held over the course of the Circuit des Ardennes, the Belgian Government and the Brussels Automobile Club having consented to allow the test racing for the English champions to take place over that course. The cars now entered are five Napiers, three Darracqs, three Huttons, and three Wolseleys. Mr. Julian Orde crossed to Brussels last Friday night in order to arrange for the eliminating event. The exact date is not yet fixed.

* * *

Only three machines have been entered as America's champions for the Gordon-Bennett race. One is a Peerless; this make, it will be remembered, competed last year. There is also a car by A. Sampson, and another by P. C. Cooper. At the present time nothing is known about the details of these cars, though the American Automobile Club will take steps to satisfy itself that they are fast enough, and generally worthy of representing the club in the international event.

* * *

A correspondent calls attention to an accident at Wolverhampton, whereby a pedestrian was knocked down by a recklessly-driven horse and trap and rendered unconscious, the driver continuing on his way without troubling to see what had happened to his victim. Our correspondent remarks that the accident, which is reported in the newspapers in the briefest possible manner, shows what little attention is paid to any catastrophe occurring with a horse, and adds, "If it had been a motor man who had driven off without looking at the man he had injured there would probably have been half a column." On page 36 of the present issue will be found a continuation of the returns of horse accidents in this country, the compilation of which was commenced some fifteen months ago, and we have no doubt that to those who have never given any attention to the matter the figures will be somewhat surprising.

* * *

The Portuguese *Diario do Governo* publishes a Royal decree establishing specific rates of duty for automobiles admitted to the Portuguese colonies at the following rates: Incomplete, with wheels and motor, each 70,000 reis (£15 10s. 8d.); complete, including vehicles to be drawn by the motor car and auxiliary motor cycles, 120,000 reis (£26 12s. 6d.) Separate parts for the repair of autocars already in the colonies will be admitted free.

"THE AUTOCAR" DIARY.

Jan. 13.—Liverpool Engineering Society. Paper, "Motor Vehicles." By Mr. W. Norris.
" 14.—Sheffield A.C. Mr. S. E. Fedden on "Electric Ignition."
" 14.—Yorkshire A.C. Lecture, "Motoring Reminiscenses." By Mr. E. Fraierson.
" 15 to 23.—Madison Square, New York, Motor Show.
" 15 to 23.—Leeds Cycle and Motor Show.
" 18.—Scottish A.C. (W. Section). Paper, "Reminiscences of the Road." By Mr. C. Jarrott.
" 21.—A.C.G.B. and I. Paper, "The Legal Aspects of the Motor Car Act." By Earl Russell.
" 23 to Feb. 4.—Brussels Autocar Show.
" 28.—A.C.G.B. and I. Paper, "Railway Companies and the Motor Problem." By Mr. G. Montagu, M.P.
Feb. 1.—Entries close for International Cup for Motor Yachts.
" 12.—A.C.G.B. and I. Non-stop Trials, Oxford Road.
" 12 to 24.—Crystal Palace Motor Car Show.
" 15.—Conference: A.C.G.B. and I. and Provincial Clubs.
" 29.—Entries close for A.C.G.B. and I. Side-slip Trials.
Mar. 19-26.—Motor Car Show, Agricultural Hall.
June 17.—Gordon-Bennett Cup Race.

In reference to the paragraph which appeared last week mentioning the various motor boats entered for the Monaco events, the length of the Napier boats should have been: Mr. H. Deutsche's Napier, 40ft., and Mr. S. F. Edge's "Napier Minor," 35ft.

* * *

In reply to several correspondents who are anxious to obtain the oiler we illustrated and described in the last issue of *The Autocar*, page 25, this is known as the Rochester automatic oiler, and may be obtained from Messrs. Markt and Co., 20, Chapel Street, Milton Street, E.C.

* * *

At Reading during the holidays, a motor car was used for the conveyance of some of the outlying mailbags by road. As a result, the mails arrived three hours earlier than in previous years. The car used was a 9½ h.p. Clément, and it carried mails weighing sixteen hundredweights over very bad roads. It was supplied by Messrs. R. Martin and Son, of Newbury.

* * *

From time to time complaints have been made, and not without cause, that in certain cases the prices charged by the British agents for foreign cars in general, and French cars in particular, have been much higher than those current in the country in which the vehicles were made. It is interesting to know, therefore, that Mr. Harvey du Cros, the concessionnaire of Messrs. Panhard and Levassor, has arranged that in future all Panhard cars shall be sold at his English agency at Panhard's Paris prices, plus transport, tyre and testing charges.

* * *

Motorists passing through Gloucester will be glad to know that they can obtain petrol and lubricating oils from Mr. A. C. Stretton, who has just opened a garage at No. 1, Worcester Street, and who also has an inspection pit.

* * *

A new pattern four-cylinder Brooke car is under way. It will develop 20 h.p., and will cost £500. A number of improvements are promised, and the car will probably be exhibited at the Agricultural Hall show in March. Speaking of these cars reminds us that Messrs. J. E. Hutton, of Shaftesbury Avenue, have obtained the sole agency for the Brooke car for London and district.

* * *

The Daimler Co. are making a limited number of 7 h.p. two-cylinder cars. These vehicles seat four people, and weigh about fourteen hundredweights. The engine, we believe, is of the same type as that which was so thoroughly tested in the first 1,000 miles trial, when the Parisian Daimlers so greatly distinguished themselves. The price is £300. We should perhaps add that the transmission is of the ordinary Daimler type, through three-speed sliding gear and outside chains.

A motor starting handle was picked up in Ladbroke Road, Notting Hill, W., just before Christmas. The owner can regain same by applying to Mr. Dennison, 3, Horbury Mews, Ladbroke Road, Notting Hill Gate, W.

* * *

Owing to the success of the Miesse steam cars during last year, the manufacturers (Messrs. Turner's Motor Manufacturing Co.) have found it necessary to considerably enlarge their premises. The present works are shortly to be transferred to the commodious factory formerly occupied by the Wulfruna Cycle Co. in Wolverhampton, so that the locality will not be changed. A large number of cars are on order, but it is not expected that the removal will delay delivery.

* * *

A day or two since we inspected a little 2¼ h.p. two-cycle engine made by Messrs. Cullen and Bowen, of 12a, Hayden Park Road, Askew Road, W., which weighs no more than 22 lbs., and will run up to, if not over, 2,000 revolutions per minute. The engine, of course, like the well-known types of two-cycle engines, has no valves, nor does it possess a carburetter in the ordinary acceptation of the term. The petrol is induced through a sprayer, and passes with its proper proportion of air into the crank chamber, whence it gains access to the space above the piston through a port uncovered by the latter. No novelty in design is claimed by the above-named makers, but they assume credit for producing a two-cycle motor which will run at very high speeds, and this they assert they have done by the most careful positioning and proportioning of induction and exhaust ports. The motor as we saw it is an ideal fitting for a motor bicycle, owing to its weight and small bulk for the power afforded. Messrs. Cullen and Bowen contemplate the construction of a four-cylinder engine for car propulsion upon similar lines, and expect to attain very special results. If they are successful, they will make an achievement, for hitherto two-cycle engines have not gained favour as car motors.

* * *

The Cambrian Railways Co. has deposited a parliamentary bill for next session, in which, amongst other things, power is sought to run motor cars in connection with or in extension of the Cambrian railway system.

* * *

"The Law relating to Motor Cars" is the title of a legal handbook just issued by Messrs. Butterworth and Co., 12, Bell Yard, Temple Bar. The authors, Messrs. H. Langford Lewis and W. Haldane Porter, barristers-at-law, appear to have touched upon most of the points likely to arise in the working of the new Act, though the manner of treatment appears to be such as to appeal more especially to lawyers than to automobilists. The notes upon the Act are full, and the cases cited as bearing upon the points dealt with form one of the most valuable features of the work.

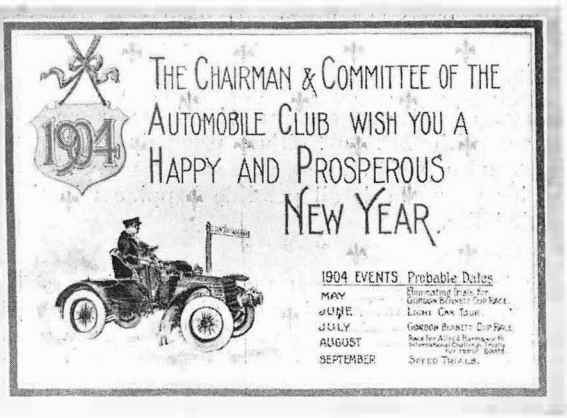
On Thursday last week, Mr. Basil Humbert Joy, the esteemed technical secretary to the Automobile Club, was married to Miss May Gooch at St. Mary's Church, Datchet. We feel sure we are echoing the feelings of all our readers who have come into contact with Mr. Joy, either privately or in his secretarial capacity, when we say that we wish him and his young bride all possible happiness in their married life.

* * *

By law it is incumbent upon every driver of an automobile not only to have applied to his County Council for a license to drive, but to carry such license upon or about him, so that whenever a blue-coated myrmidon of the law feels that the exhaustion consequent upon automobile stalking can only be charmed away by the sight of a license, he may hold up the next car that comes his way and refresh himself with the tonic that nothing but license-gloating will afford. It being within the bounds of possibility that a driver may be obliged to produce his permit with greater frequency than a railway passenger is asked to show his season ticket, one would have thought that the bodies charged with and profiting by the issue of such permits would have taken some thought as to their convenience in form. But no, far from it, for all the licenses that have come as yet within the purview of the present scribe are made out on thin sheets of paper as large or larger than a page of foolscap. Nor is this perishable, tearable, and absorbent sheet to do duty for one year only. In their high economy the Councils seek for them to do duty for three years, they being furnished at foot with renewal forms for two years over and above the year of issue. Just what that license will look like after the wear and tear of three years it is difficult to imagine. What the Surrey County Council, for one, has lacked in thought they have made up in area, for the computed superficies of their license form amounts to no less than 99.375 square inches. Quite a poster!

Photo *Campbell & Gray.*

THE AUTOCAR IN PANTOMIME. The above illustration depicts an amusing scene in a pantomime now being presented at the Hippodrome, Leicester Square. The length to which the absurdities are carried out is well depicted by the enormous spanners which are seen lying around, as well as the jack, shovel, and the attitudes of the members of the caste who take part in this scene. Needless to say, motor cars have reached such a state of reliability that such incidents do not now occur on the roadside.



The New Year's Card of the Automobile Club

Messrs. Clément-Talbot, Ltd., inform us that they have become the possessors of all the patents owned by Messrs. A. Clément, of Paris, and are about to take action against the large number of infringers who have imported Clément cars into this country otherwise than through them or their recognised agents.

* * *

We would draw the attention of our readers to some very interesting queries which appear on page 51. One of these queries relates particularly to the employment of an auto-trembler, while the other deals principally with the fitting of an extra air valve to the motor, and the consequences resulting therefrom. Among our readers there must be several others who have tried similar experiments, and we shall at all times be glad to have the results of their experiences given in reply to such queries as we may publish from time to time. These replies would be of very great interest to a large number of our readers. Those who care to reply may be assured of their efforts being appreciated by fellow motorists both at home and abroad.

* * *

"Is motor farming feasible?" This subject is being discussed in the pages of *The County Gentleman* in a series of articles by practical agriculturists. In reply to the objection that "the installation of a system of motor cultivation would be exceedingly expensive," details are given to show that, while horse plant (eight horses and necessary implements) would cost £763, a correspondingly capable motor cultivation plant would cost only £565. The cost of maintenance is £240 for horses against £286 for motors, while the comparative cost of working averages 7s. per acre for horses, against 3s. 4½d. for motors. These figures are those of Mr. John Scott, of Edinburgh. The figures of the Ivel Agricultural Motors Co. show that one of their agricultural motors has ploughed with a double-furrow plough 2 acres 15 poles with a very hard surface, to an average depth of 7in., in 5h. 49m., at a cost of 7s. 8d. per acre, and with a three-furrow plough 6 acres 1 rood, to an average depth of 7in., in 8h. 54m., at a cost of 5s., per acre. A number of stock objections are ably replied to, and it is clearly shown that motor farming is not only feasible, but eminently practical and economical, and that it possesses advantages over the old methods at almost every point.

Messrs. H. E. Hall and Co., of Tonbridge, inform us that they are sole agents for Clincher-Michelin tyres throughout Kent, and for twenty miles round Tunbridge Wells. They are also just opening a new garage in Tunbridge Wells, and have lately opened a place in Brighton.

* * *

Owing to a greasy surfaced road in Reading on Sunday, a car belonging to an Oxfordshire gentleman collided with a tree. The impact was so severe that upon examination of the car it was found that the steering gear, engine box, and front axle were badly damaged. Fortunately, the occupants were not hurt.

* * *

We are informed that the Société Decauville of Paris have commenced proceedings against the Darracq Company to restrain the latter from using upon the Darracq cars an alleged copy of the Decauville metal shield, which supports the motor and also protects the mechanism entirely from mud and dust encountered upon the road.

* * *

Cordingley's ninth International automobile exhibition will be held from March 19th to 26th, 1904, and already promises to be the largest of the series yet held. More than 250 exhibitors have already booked space, including leading British and American firms, while all the principal Continental cars will be on view. Heavy motor vehicles will be relegated to the Minor Hall, and will comprise motor 'buses, public service vehicles, agricultural motors, and lorries. The Aero Club will exhibit military balloons (some of which were actually in use at Ladysmith) and historic airships. The Berners Hall, King Edward's Hall, and all the annexes and galleries will also be devoted to the purposes of the exhibition.

A LIGHT DELIVERY VAN. In our report of the Paris show we referred to the fact that Messrs. Chas. Jarrott and Letts were exhibiting the first specimen we had seen of one of their little Oldsmobile cars fitted up for carrying parcels. The arrangement of the engine and mechanism is practically the same as it is in the ordinary Oldsmobile, and we understand that several large American houses have taken them up and have found that they effect a considerable economy as compared with horse haulage. The price is 200 guineas, and we hear that a good many London houses who have to deliver a large number of small parcels are turning their attention to these handy little cars and arranging for trials of their capabilities.

SOME QUERIES AND REPLIES.

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

When advice concerning different makes of cars is sought, each vehicle should be given an identifying number.

Letters should be addressed The Editor, "The Autocar," Coventry.

IGNITION QUERIES.

(1.) I have an 8 h.p. De Dion car, and I find occasionally some difficulty in starting the engine. Some time ago the auto trembler was introduced, and, as stated by the makers, there is no trouble in starting any engine where it is applied. Can you tell me if this is the case, and would you advise me to try it? (2.) Does an accumulator last as long with a trembler coil as with an ordinary make and break? (3.) An ordinary four-volt accumulator appears to give as good a spark as the six-volt dry battery sent out with De Dion cars. I am told that to use an accumulator would damage the coil. Is this so?—A.M.

REMOVAL AND LICENSE.

I have a license to drive a motor car issued by the —— County Council. When applying for the license I asked the Clerk to the Council if I should remove to another county whether I should have to obtain another license in the county or county borough in which I was then residing, or should I have to notify my change of address and have the present license endorsed to that effect? The Clerk said he could not say what would be the proper course to adopt. He did not think it would be necessary to take out another license. I should have to take the risk (if any), and it would be a matter for the police. If this should prove to be a technical offence, I fear the police will not be slow to take advantage of it, but perhaps you can, through your valuable paper, tell me definitely if there is any risk to incur.—J.P.H.

There is nothing in the Act to require you to take out a fresh license on removing from one county to another. A license remains in force for twelve months, and the proper course to take would be to notify to the issuing authority your change of address, so that the new address might be entered on their register and endorsed on the license if necessary. You will not be running any risk if you take this course.

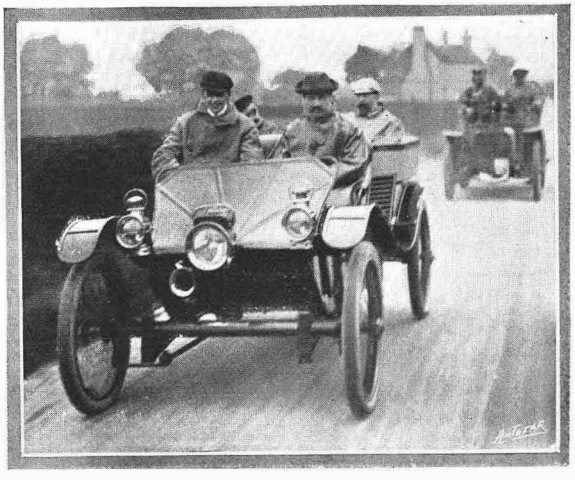
DE DION QUERIES.

I have an 8 h.p. single-cylinder De Dion car, upon the induction pipe of which I have fitted an auxiliary air valve, such as described in *The Autocar* early last year. This makes the carburetter nearly automatic, and effects considerable saving in petrol. In order to effect further economy of fuel and to enable the engine to run slower when standing, I have fitted a slide throttle valve, which is situated between the cylinder and the auxiliary valve, this latter being close to the carburetter. This throttle is decidedly an improvement in the means of control, but I find when running with it almost closed as when going down a gradient or with free engine that petrol oozes along and drops out of the air intake orifice of the carburetter. When running the car this petrol splashes all over the engine and everything else under the bonnet, and when standing still makes a pool upon the ground. When the throttle is half opened this leakage of petrol ceases. I am somewhat puzzled as to the cause of this. I have thought perhaps that the wire drawing of the gas at the nearly closed valve causes condensation of petrol vapour, but I hardly see that this can be so. It appears more probable that a portion of the spray of petrol is projected bodily backwards, and that the obstruction caused by the valve in some way induces this. It has occurred to me to lower the level of the petrol in the float chamber, but would not this spoil the action when running with the throttle wide open up a gradient. I have also fitted an auto trembler to the sparking apparatus, and use five dry cells, by which when working I get a spark of best character one-twelfth of an inch long. This is a great improvement upon the ordinary De Dion sparking apparatus, and causes the engine to yield decidedly more power. I shall be glad if you will inform me whether by introducing another plug into the firing chamber and arranging electrical matters so that I simultaneously obtain another such spark, I am likely to obtain a further decided increase of power, or whether the rate of deflagration will not be much improved thereby?—THROTTLE VALVE.

PETROL CONSUMPTION.

I have been driving a 12 h.p. Clément-Talbot car for some six months on Pratt's B petrol, on which it has run well, but I have lately used A petrol, the B being scarce. The car has been running well, but seems inclined to heat, though the pump is working well. I have found lately that I cannot use the accelerator pedal. Directly I press it down the car slows at once. Can you explain this? The throttle is working all right, and the only explanation I can think of is that there is not enough mixture in the carburetter. (Extra air inlet full open, float screwed rather low.) I should be glad to know if any other drivers of Clément cars have had the same experience. The car is delightful to drive, and wonderfully reliable, but I have found it a voracious petrol eater.—H. G. WEDD.

We have also found a 12-16 h.p. Clément-Talbot run remarkably well on Pratt's B motor spirit. If our correspondent has had his carburetter down—and he does not say that he has not—he has in all probability connected up his throttle valve to the pedal rod, so that when he presses the pedal down the valve is closed, and when it springs up the valve is opened. This would also account for the petrol voracity he complains of. Several cases of the kind have come under the notice of the British agents, and in each case it has been due to the throttle butterfly valve getting turned over. In any case, we would suggest that our correspondent should take down his carburetter and clean out the petrol passages and gauze filters. Again, it is not impossible that our correspondent's float has got out of adjustment, as he says the float seems rather low, and, if so, he must take the cover of the float chamber off and adjust the height of the cork float on the float rod, so that the level of the spirit in the chamber is such that a bead of petrol just stands on the top of the jet.



A snap-shot of a party of well-known automobilists in Surrey

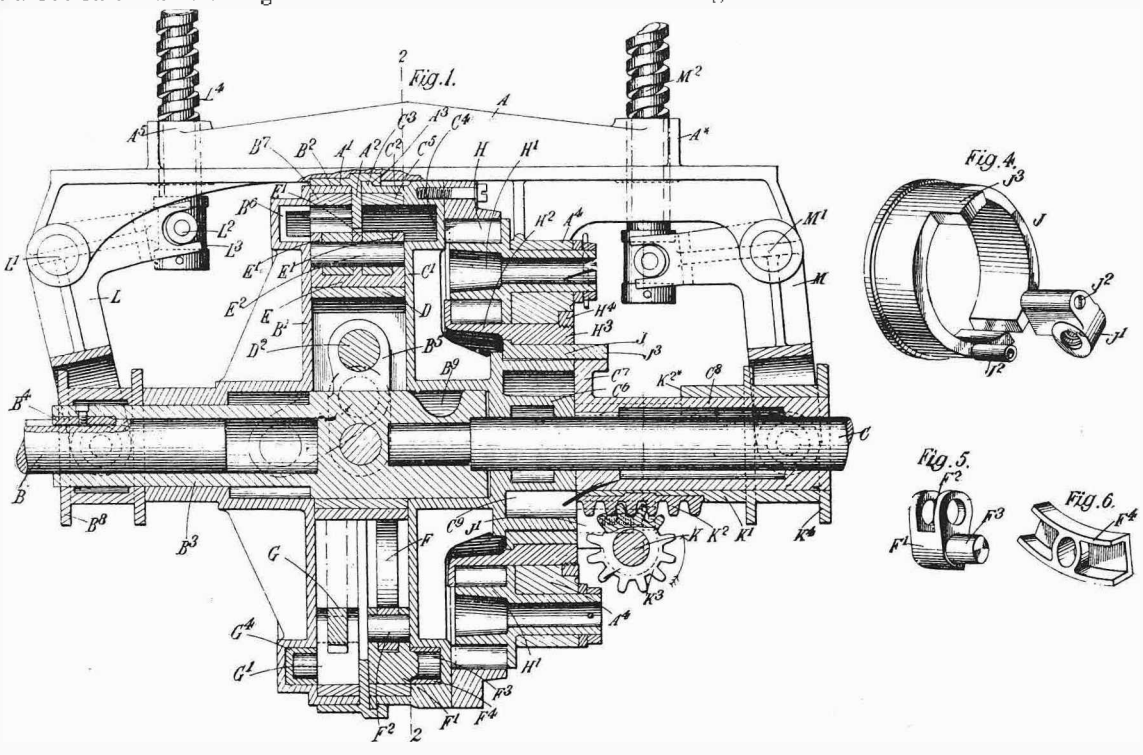
THE BRITISH GORDON-BENNETT CARS.

A New Variable Gear.—Fourteen Cars entered.

FOURTEEN BRITISH CARS, BY FOUR DIFFERENT MANUFACTURERS, HAVE BEEN ENTERED FOR THE ELIMINATING TRIALS. ALL FOUR MAKES PRESENT A NUMBER OF SPECIAL AND INTERESTING FEATURES, AND WE ARE ABLE TO GIVE SOME PARTICULARS OF THE NEW INFINITELY VARIABLE GEAR WHICH WILL BE FITTED UPON THE HUTTON CARS.

In addition to the five Napier cars which have been entered for the eliminating tests, which will decide the cars that shall represent Great Britain in the Gordon-Bennett race next June, three Hutton and three Darracq vehicles have also been entered. Not only so, but three Wolseley cars have been entered for the eliminating trials, two of them of 96 h.p. nominal and a third of 72 h.p. They will embody many novel points in construction, particularly in the means adopted to reduce wind pressure to the lowest possible limit. The horizontal four-cylinder type of engine will be retained. This, of course, is particularly suitable for a racing car, and enables the centre of gravity to be brought extremely low—a point of no little importance in racing, as it enables the driver to negotiate bends of the road at a higher speed than he otherwise could.

At present we are able to give no further details of the Wolseley, Darracq, and Napier cars, but with regard to the Huttons we may say that they will be driven by six-cylinder engines, the cylinders, water jackets, and valve gear being a completely new departure, and it is claimed that the engine only weighs 5½ lbs. per horse-power. The radiator is also a new model, and exceedingly light, being made entirely of aluminium. The brakes are of a new pattern, one of them being worked hydraulically from a button in the steering wheel. Even the axles and the wheels depart from the standard model, the great idea of the design as a whole being to provide enormous power with ease of control. Perhaps the most novel feature about the car is the variable change-speed gear. This is not like the ordinary gear, which gives three or four positive speeds, but it provides infinite variation between zero and maximum—*i.e.*, the gear can be raised from nothing by imperceptible graduations, to the very highest possible for the engine to drive, and it can be decreased in the same way. The actual gear change will be worked by oil pressure, a small lever on the steering wheel changing the speed as required, so that for the first time in motor car practice the motor will be run at its maximum horse-power and at a constant speed, the ratio of the gear being altered to suit the varying resistances of the road, except, of course, at such times as slacks or stops are required for curves or traffic. This gear is known as the Barber, and although certain modifications have been made in it, the general principles on which it works are made clear in the abridgment of the patent, which we give herewith. For those who are not mechanically inclined, it will be sufficient to say an eccentric on the drivingshaft is made to push or drive a ring encircling it by means of intervening and simple mechanism. The degree in which the eccentric is moved regulates the distance which the car is



Longitudinal sectional elevation and details of the Barber variable gear

driven at each revolution of the engine. That is to say, when the movement is reduced to nothing the car does not move, but as the eccentricity is advanced the car begins to move, and as it is increased the speed is proportionately increased, but not in sudden jumps or steps. These Hutton cars will be very interesting, inasmuch as every part of them is more or less novel. The idea of an infinitely variable gear, and what is known as the variable feed, is very old, but the ends by which it is attained are distinctly different from those which have gone before, so that it is practically certain, with the many new features there are in the cars, they will either be conspicuous successes or the reverse. Those concerned in their construction are certainly not lacking in pluck, as it requires great faith to introduce more or less untried methods into a car which is intended for the very severest strain to which a car can be put. If success is attained everyone congratulates the pioneers upon their daring and enterprise; if they fail, they are jeered at as foolish experimenters.

ABRIDGED SPECIFICATION OF THE BARBER GEAR PATENT.

The gear is carried at its centre by an annular frame A^1 secured to a main frame member A, and is supported at its ends by the driving and driven shafts B and C respectively, each of which is carried in suitable bearings not shown in the drawings. The annular frame A^1 is provided with a central flange A^2, on either side of which are mounted discs B^1 C^1 respectively, each provided with an annular peripheral flange B^2 C^2, so that they form dished members B^1 B^2 and C^1 C^2 respectively. The flanges B^2 C^2 face each other, and, being in contact with the frame A^1, form with the discs a dust proof chamber or casing within which the gear is mounted.

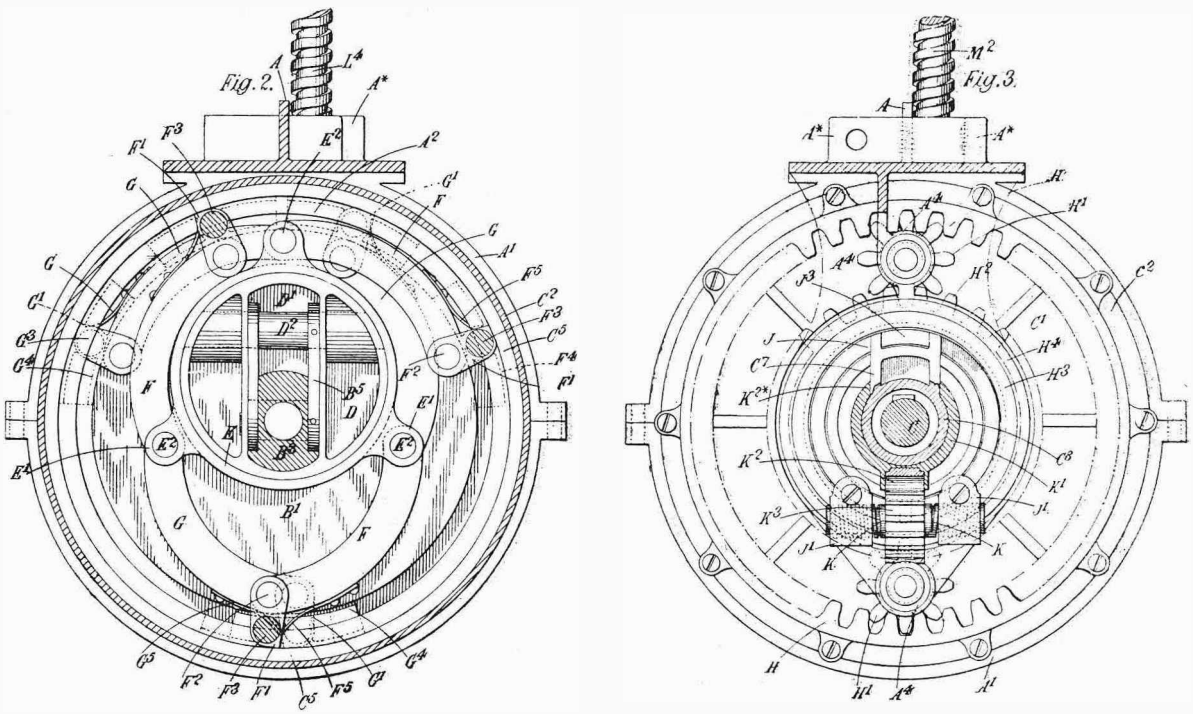
The members B^1 C^1 are supported at their edges by the frame A^1 and at their centres by the shafts B and C which pass through them. The member B^1 is stationary, and is secured by its flanges B^2 to the frame A^1, but the member C^1, which is the driven member, is free to rotate and is provided with a peripheral lip C^3 which engages an annular groove A^3 in the frame A^1. The annular member C^1 C^2 is thus held in place by, and is free to rotate in, the surrounding portion of the frame A^1, and the latter is made in two parts as shown in figures 2 and 3 to permit the insertion of the lip C^3 in place.

The driving shaft B is provided with a sliding sleeve B^3 interposed between the disc B^1 and the shaft, and it projects through the disc into the space between the discs B^1 C^1, its inner end being hollowed to receive the adjacent end of the shaft C, so that the sleeve serves as a strengthening link between the two shafts.

The sleeve B^3, while being free to slide upon the shaft B, is compelled to rotate with it by means of a feather B^4. For reciprocating the sleeve, a clutch ring B^5, engaged by a forked arm L pivoted at L^1 to the frame member A, is employed. The free end of the arm L is formed to engage a pin L^2 in a sleeve L^3 carried at the end of a screw spindle L^4. The spindle L^4 is carried in a screw threaded lug A^5 on the frame member A, and may be rotated by any convenient means. As the spindle L^4 is rotated in one direction or the other, the end of the arm L in engagement with it will be raised or lowered, so that the sleeve B^3 is moved endwise towards, or away from, the member B^1.

In the space between the discs B^1 C^1 is mounted an eccentric D which is thus prevented from moving endwise. The eccentric D is provided with a central slot D^1 through which the end of the sleeve B^3 projects. Pivoted on either side of the end of the sleeve B^3 are links B^5, the free ends of which are pivotally connected to the eccentric by a pin D^2 at one end of the slot D^1. Surrounding the eccentric D is a strap E having ears or lugs E^1. The lugs E^1 are arranged in sets of three opposite each other and disposed at three different points on the periphery of the strap, preferably equidistant from each other. Each sets of three lugs thus arranged form two jaws between them adapted to receive the ends of arms pivoted to the lugs by pins E^2, and one of the jaws of each set lies within the annular member C^1 C^2, and the other within the member B^1 B^2. In the jaws which lie in the member C^1 C^2 arms F are pivoted, and they extend forward within the annular member C^1 C^2, all in the same direction as shown in figure 2.

To the free ends of the arms F pawls are pivoted, each of which is provided with a jaw F^2 to receive the end of the arm F, and carries a pin F^3 on that side which lies



End elevations and part section of the Barber variable gear.

against the dish-shaped member C^1 C^2. The pin F^3 is placed near the free end of the pawl, and is received by a sliding piece or shoe F^4 and adapted to slide in an annular groove C^4 formed in the face of the disc C^1. A spring F^5 is mounted on the free end of each of the arms F and bears against the free end of the pawl F^3, consequently the engaging end of the pawl is always kept in contact with the flange C^2 of the member C^1, or a hardened lining C^5 on the flange.

It is preferable, however, to permit it to rotate, and for this purpose in the jaws thereon which lie within the dished member B^1, arms G are pivoted similar to the arms F, but facing in the opposite direction, and to the free ends of these arms are pivoted pawls G^1, having a jaw similar to the jaw F^2 on the pawls F^1 to receive the arms and a pin G^3 engaging a shoe G^4, all of which parts correspond to those of the arms F. The shoes G^4 slide in an annular groove B^4 in the face of the disc B^1. Springs G^5 are also fitted to maintain the pawls G^1 in contact with the flange B^2, or its liner B^3, of the dished member B^1.

The operation of this gear is as follows:

As the drivingshaft B rotates, the sleeve B^3 will, of course, rotate in the same direction, carrying with it, by means of the links B^5, the eccentric D. As the eccentric rotates, the strap, presuming it cannot rotate, will descend so that the free end of the arm F on the lower right-hand side of figure 2 will be made to travel to the left of the figure advancing its engaging device along the flange C^2 of the member C^1.

Still presuming the strap not to rotate, the eccentric, having completed half a revolution, will now begin to raise the strap, so that the arm F before referred to will be pulled upon in the opposite direction. The engaging device at the free end of the arm thus grips the flange C^2 of the dished member C^1, so that this member, being free to rotate, travels round with the arm until the strap E has again reached the position shown in figure 2.

It will be seen that this operation may be continuously repeated with the arm referred to, and that both of the other arms F also act in turn, so that continuous movement is imparted to the member C^1 so long as the strap E is itself prevented from rotation.

It is, however, preferred to rotate the strap in the opposite direction to that in which it would naturally rotate when the arms F engage the member C^1, and for this purpose the second set of arms G is provided. These arms, as described above, face in the opposite direction to the arms F, but are operated by the gyrating movement of the strap in exactly the same manner as the arms F, with the exception that as the annular member B^1 B^2 is stationary, the strap E is caused to rotate in place of the member By the rotation of the strap, double the amount of movement given by the arms F is imparted to the member C^1.

To vary the speed at which the member C^1 is driven, the sleeve B^3 on the driven shaft is moved in one direction or the other by the screw L^4, so that the links B^5 are made to pull upon the eccentric D, drawing it towards a position concentric with the shaft B or pushing it from this position so that it becomes eccentric to the shaft. The position of greatest eccentricity is shown where the links B^5 are at right angles to the shaft, but it will be easily understood that as the sleeve B^3 is withdrawn from the member B^1 the links B^5 are gradually inclined until they are brought into the position shown in chain lines in figure 1. In this position the centres of the eccentric D and the drivingshaft B coincide so that the strap E is not moved by the eccentric and the shaft B runs without imparting movement to the member C^1.

For the purpose of reversing, toothed gearing is introduced, and a clutch by which the member C^1 may either be secured directly to the shaft C or connected with it through the gearing. The gearing comprises an internally toothed ring H made fast to the member C^1 and gearing with pinions H^1 carried in bearings in a hanger A^4 made integral with, or secured to, the frame member A. Gearing with the pinions H^1 is an annular spur wheel H^2 provided with an extension or boss H^3, by which it is carried in a suitable bearing in the bracket A^4 between the pinions H^1. To prevent the extension H^3 from being withdrawn from the bearing, a collar H^4 is screwed on its free end and bears against a recessed portion of the bearing in the bracket A^4.

The disc C^1 is provided with a boss C^6 by which it is carried on the shaft C, and between this sleeve or boss and the interior of the boss H^3 of the toothed wheel H^2 is mounted a split ring J, shown in detail in figure 4. The ends of the split ring are connected by a right and left-handed screw-threaded spindle K operating in lugs J^1 carried by pins J^2 secured to the ring, and the ring is permanently connected by a lug J^3 to an arm C^7 fast on a sleeve C^8 keyed to the driven shaft C.

Free to slide on the sleeve C^8 is a sleeve K^1 carrying a rack K^2 which engages a pinion K^3 fast on the screw spindle K by which the two ends of the split ring are connected. This sleeve is operated in the same manner as the sleeve B^3, being provided with a clutch ring K^4, an operating arm M pivoted at M^1 to the frame member A and rocked by a screw spindle M^2; and it is cut away at K^{2*} to allow the arm C^7 of the sleeve C^8 to project and to permit endwise movement of the sleeve K^1, while the boss C^5 of the disc C^1 is recessed at C^9 to receive the end of the sleeve K^1 when moved towards the disc.

The operation of this reversing mechanism is as follows:

If the sleeve K^1 is moved towards the left of figure 1, the pinion K^3 will be rotated in the direction indicated by the arrow, and the ends of the split ring J drawn together so that the ring will be firmly contracted upon the extension of the boss C^6 of the member C^1. The member C^1 is thus directly connected with the driven shaft C, so that this shaft may be driven in the same direction as the shaft B at a speed which varies according to the amount of eccentricity given to the eccentric D.

If now the sleeve K^1 is moved in the opposite direction, the driven shaft is first freed from its connection with the drivingshaft, and if the movement of the sleeve is continued, the split ring is made to bear against the interior surface of the boss H^3 of the toothed wheel H^2. The wheel H^2 is continuously rotated so long as the member C^1 is in movement, but in a reverse sense to this member through the interposition of the pinions H^1. In consequence, as soon as the split ring J is brought into engagement with the toothed wheel H^2, the shaft C, with which the ring is connected by the arm C^7 and sleeve C^8, is rotated in a reverse direction to the drivingshaft B.

It will be seen, therefore, that by means of this mechanism the driven shaft may be rotated in either direction at any speed within the limits of the gear, which are of considerable extent.

IMPORT DUTIES ON AUTOCARS.

About nine months ago we published a list of import duties on automobiles imported to foreign countries. This we are now able to supplement with further information of additions and modifications, which brings the list completely up to date, so that it will be of value alike to tourists and to those interested in exporting.

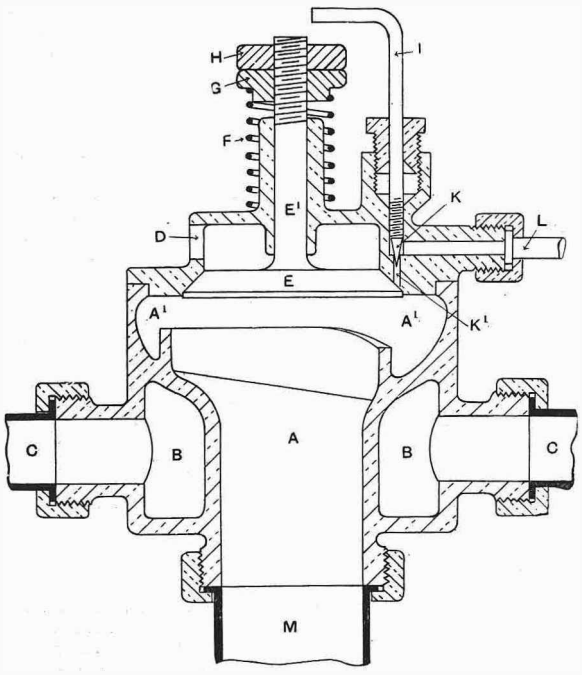
In Sweden autocars are assessed for import duty under the heading of "vehicles of all kinds not specially mentioned," the rate of duty on which is fifteen per cent. *ad valorem*. Peru will admit automobiles free of duty, but the Argentine Republic charges a duty of sixty-two per cent. on the value, with the important addition that the customs authorities assess the value of each vehicle. These are the only alterations in the list of foreign countries as previously published. Turning to the British Empire, India demands a five per cent. *ad valorem* duty, but Ceylon charges five and a half per cent., making, however, an exception in the case of motor cars used for traction, which are admitted free of duty. At Mauritius a duty of 10.4 per cent. *ad valorem* must be paid. In the South African Customs' Union (which includes Cape Colony, Natal, Orange River Colony, the Transvaal, and Southern Rhodesia) motor vehicles of all classes pay a duty at the rate of five per cent. *ad valorem*, but a rebate of twenty-five per cent. of this is allowed if the goods are British.

Automobiles are not specially named in the Canadian tariff, but carriages and vehicles not specified pay thirty-five per cent. *ad valorem*. A reduction of one-third of the duty is allowed if the car is of British manufacture. The duty on automobiles in use by tourists travelling in Canada is refunded on re-exportation within a period fixed by the collector of customs, but not to exceed six months.

THE CREMORNE CARBURETTER.

For Petrol or Paraffin.

We are pleased to be able to give herewith an elevation and sectional elevation of the new pattern Cremorne carburetter, made by the Cremorne Motor Manufacturing Co., of 27, Lots Road, Chelsea. The accompanying lettered diagrams and reference are sufficient to convey to our readers a clear idea of the simple construction of this neat little apparatus. By reference to the section it will be seen that the suction on the induction stroke of the engine to which this carburetter is attached causes the automatic valve E E^1 to move downwards from its seating thus allowing air to gain access to the mixing chamber A, and at the same time uncovering the petrol port K^1 formed in the seating of the valve as



The Cremorne carburetter.

A, mixing chamber
A^1, spiral whorl in carburetter wall
B, exhaust jacketed space
C, pipe conducting part of exhaust
D, air inlet
E, automatic air and petrol valve
E^1, automatic valve stem
F, valve spring
G, spring washer
H, lock nut
I, stem of petrol needle valve
K, petrol needle valve
K^1, petrol port
L, petrol supply pipe
M, induction pipe

seen on the right hand side of the section. Petrol is conveyed to this port by the petrol supply pipe L, but the amount delivered through it upon the opening of the valve E is controlled at the needle K. Now the inner walls of the mixing chamber A are formed in the space of a spiral whorl A^1, the form and pitch of which are indicated on the section. The air admitted in an outward sprayed form through the valve strikes into this whorl, courses round it, and picks up the petrol entering through the needle valve K^1, becoming thoroughly carburated in the exhaust jacketed mixing chamber A before passing on to the cylinder through the induction pipe M. The petrol feed can be minutely controlled by means of the needle valve, and it will be realised that the faster the rotation of the motor, and the greater the consequent suck of its piston the more will the valve E open, admitting a larger quantity of air, while the petrol feed remains constant, or nearly so. Thus, it is claimed a Krebs-like effect is

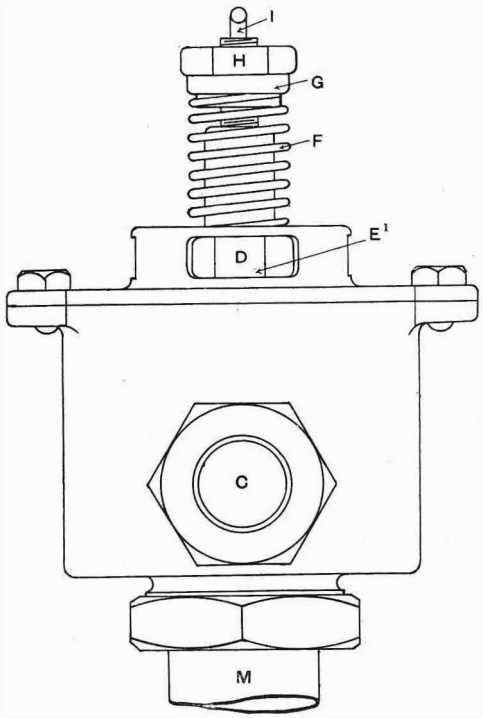


Fig. 2.—Elevation the Cremorne carburetter. For reference letters see fig. 1.

obtained. When visiting the Cremorne Works lately we saw common lamp paraffin turned into one of these carburetters after the engine had been run until nicely warmed on petrol, and although the exhaust instantly became visible, and was far from inodorous, yet the speed of the motor increased considerably. We might add that the carburetter will function perfectly in any position. There is no need to fix it in the position shown in the diagrams.

We have published from time to time a good many proofs of the efficiency of the Parsons anti-skid chains so far as their action as preventers of side-slip is concerned, while our own use of them has confirmed the good opinions which have been expressed by others. However, a new virtue has been discovered by a Naples user who drove his car to Geneva, crossing Mont Cenis *en route*. At high altitudes a foot and a half of snow was encountered, but the Parsons chains enabled the driving wheels to get a grip upon the powdered surface; in fact, Mr. Vickers, the owner of the car, was so struck with the adhesion provided by the chains that he proved it by *reductio ad absurdum*. In other words, he took the chains off and found it impossible to get the wheels to bite without them.

THE WORKING OF THE NEW ACT.

HOSTILITY OF RURAL DISTRICT COUNCILS.

Amongst local authorities in rural districts there is a disposition to regard the Motor Car Act of 1903 as an instrument for ridding their roads of the presence of what they consider an objectionable form of vehicle. Before the Act has been in operation very long they will no doubt find out their mistake. From reports which have come to hand it would appear that some of them meet and in the most light-hearted manner pass sweeping resolutions to close all their roads, without exception, against motor cars. They first instruct their surveyor to report upon the suitability of the roads for motor traffic. The surveyor perhaps a worn-out butler or a groom formerly in the employ of one or other of the members, or it may be a broken-down village shopkeeper—reports in such manner as he considers will best please his council. The matter is solemnly paraded on the agenda for discussion, and the "closing" or "restricting" resolutions are passed with the necessary legal tinge imparted to them by the clerk. Apparently they overlook the fact that the passing of such resolutions in no wise settles the matter, and that even if they had their will the restrictions they would impose would also carry with them certain duties and financial responsibilities. They next pass resolutions objecting to put up warning notice boards for the benefit of motorists, and then the chairman of the council, or other highly talkative member, commences a tirade against "those horrid abominations," and is applauded by his fellow members, who may be less liberally endowed by nature with facile powers of expression. As a result of such conference, they agree, by a process of reasoning peculiar to their natural genius, that not only ought motor cars to be restricted and prohibited in the manner already agreed upon, but as a gratuitous piece of academical advice to all whom it may concern, they place on record their deliberate opinion "that motor cars ought to be heavily taxed.

Safeguards against Restrictions.

It is a pity that the clerks of such bodies, whose duty it is to keep them straight legally, do not acquaint themselves with the provisions of the new Act so far as it affects them, and prevent these truly rural district councillors from making such sorry exhibitions of themselves. For example, if the clerk would not only point out the bare provisions of Section 8 of the new Act, which gives power to prohibit motor cars upon special roads, but would call their attention to the provisions of other enactments bearing on the same subject, they would probably curb their zeal to some extent. By very little study the clerk would find out that the power to "prohibit or restrict the driving of motor cars" is not such a drastic provision as at first sight it would seem. He would have to inform the rural district councillors that the "power" which they no doubt fondly imagine is vested in themselves does not belong to them at all, but is vested in the Local Government Board, who alone may "prohibit or restrict the driving of any motor cars or of any special kind of motor cars on any specified highway which does not exceed sixteen feet in width, or on which ordinary motor car traffic would, in their opinion, be especially dangerous." Before the Local Government Board can make regulations to the effect indicated they must form an "opinion" that the roads which are sought to be closed are "especially dangerous," and to enable them to do this an inquiry is necessary. The question of the width of a road, however, is one of fact and measurement. Even on this score the closing of a road is not so light a matter as rural district councillors imagine. The width of sixteen feet must be measured between the fences which bound the road on either side; and even supposing the road should be less than sixteen feet wide, there is a provision in the Highways Act of 1835 empowering two justices of the peace to order the road to be widened, provided there be sufficient unoccupied land to enable this to be done. By the same Act the surveyor is also required to make and maintain the roads leading to any market town at least twenty feet wide. It is questionable, therefore, whether the Local Government Board would have power to make the closing and restricting regulations which hostile rural councils crave until the possibilities of the Highway Act of 1835 are exhausted. Should the inquiry stage be reached, the costs of such inquiry would have to be paid from the local rates. The imposition of restrictions and special speed limits would also involve considerable trouble and expense on the part of local authorities in giving public notice of such restrictions, for this is a duty specially imposed upon them by Section 10 of the new Act. They are required to "place notices in conspicuous places on or near the highway, part of a highway, limits, or place to which the regulation refers." It is therefore obviously not intended that these restrictive regulations should apply to districts in the wholesale fashion that some rural district councils seem to imagine. It must be noted that the only local authorities competent to approach the Local Government Board on these matters are county and borough councils.

Higher Powers.

The zeal of these small anti-motoring councils will therefore be subject to the restraining influences of county councils, who, by the way, will have to pay the costs incidental to the making and notifying of any restrictions. In the face of the plain recommendation from the Local Government Board to local authorities that they should refrain from proposing any extended resort to the restrictive powers of the Act until it is seen that the other provisions of the statute render such resort indispensable, it is not likely that the resolutions of panic-stricken and prejudiced rural district councils will be of much avail. They may pass resolutions to their heart's content for the wholesale prohibition of motor cars within their territory, but their demands will be subject to the sanction of a higher authority, which has made a definite pronouncement in favour of toleration towards motor cars. On the whole, therefore, automobilists need not be unduly alarmed at the hostile resolutions which are being passed by such rural district councils as Yeovil (reported in *The Autocar* of last week) or Holbeach, to which our attention has been called. This body, which is mainly composed of farmers of the district (says a newspaper report), has unanimously passed a resolution that motor cars should be restricted to a speed of ten miles an hour on the whole of the roads under their jurisdiction. They also objected to putting up warning notice-boards for the benefit of motorists, and the Chairman expressed the opinion, in which other members concurred, that motor cars ought to be taxed at £50 and motor cycles at £10.

The Act in South Wales.

For the county of Glamorganshire the distinctive letter is "L," and the fact that a single letter has been allotted has caused several Cardiff owners to register their cars in the county rather than in the borough, so that their registered numbers will be less unsightly. Up to the time of writing forty-three cars and eighteen motor cycles have been registered by residents of the county, and five cars and three cycles by residents outside the county. Fifty one drivers of cars and ten of motor cycles have been registered. At Cardiff about thirty cars and thirty-two motor cycles have been registered, and thirty-one drivers of cars and thirty motor cyclists have been licensed.

At Swansea eighteen cars, seven trade cars, and sixteen motor cycles were registered, and thirty-one licenses to drive were granted.

The Demand for Lamps.

The impossibility of immediate compliance with the provisions of the new Act is well illustrated by the fact that although the Lanchester Engine Company, of Birmingham, placed orders for over 300 lamps to supply their customers immediately on the regulation being made known, they have been unable to obtain sufficient supplies to meet immediate demands, and they are being bombarded by telegrams from all quarters. Doubtless the illuminating provisions of the new Act will have to remain practically a dead letter for some considerable time, or at any rate until lamp makers are able to get even with the demand that has necessarily arisen all of a sudden.

As a matter of fact, the police authorities throughout the country are recognising the difficulty, and are not at present enforcing the illuminating clauses of the Act.

CLUB DOINGS.

Berkshire A.C.

This newly-formed club, we are informed, is making satisfactory progress, upwards of forty members having been elected.

Yorkshire A.C.

The annual general meeting of this club will be held on Thursday evening, January 14th, in the club room at the Great Northern Hotel, Leeds, when the following business will be transacted: Election of officers and committee for the ensuing year; yearly balance sheet; general business of the club. A lantern lecture by Mr. E. Fajers, of Bradford, will follow the general meeting at 8 p.m., when a large selection of slides will be exhibited. On Thursday, January 28th, in the club room, Mr. Winn will open a discussion on "The Motor Car," when the various parts of a motor car will be discussed separately.

Sheffield A.C. 50 Miles Non-stop Trial.

The non-stop trial arranged by the Sheffield and District Automobile Club took place during the holidays. The course was over a distance of fifty-three and threequarter miles, the route being from Sheffield to Newark, *via* Worksop, and back to Ollerton. Despite the inclement weather, a fairly large number of spectators assembled outside the Sheffield Town Hall, Surrey Street, to witness the start. Mr. J. E. Evans was the first to go off on his 12 h.p. Darracq, followed by Mr. B. Hind on a 9 h.p. Clément, the other starters being Mr. J. Hind (6 h.p. La Plata), Mr. J. H. Picktord (10 h.p. Wolseley), Mr. J. F. Pickering (10 h.p. Norfolk), Mr. C. A. Clark (6 h.p. Gladiator), and Mr. B. Shaw (6 h.p. De Dion). Notwithstanding the state of the roads, which were very heavy, especially between Sheffield and Worksop, a fine pace was maintained. Three cars gave up before completing the course. Mr. J. Hind, when within a few miles from the finishing point, ran short of petrol. Mr. J. F. Pickering and Mr. C. A. Clark had ignition troubles. The cars to finish were Mr. B. Hind's Clément, Mr. J. E. Evans's Darracq, Mr. Pickering's Wolseley, and Mr. B. Shaw's De Dion.

The Motor Union.

The first meeting of the General Committee of the Motor Union of Great Britain and Ireland has been fixed for Monday next at 119, Piccadilly. In future this body will meet regularly once a month. The General Committee, representing automobilists belonging to all parts of the kingdom, altogether apart from the fact of their being members or non-members of the A.C.G.B.I., is in effect the Grand Council of British automobilism. It is composed of (a) representatives of the A.C.G.B.I., (b) representatives of other automobile clubs and organised bodies interested in mechanically-propelled vehicles, and (c) representatives elected by those members who have joined the Union as individuals. All these bodies elect their representatives on the same scale, viz., two representatives for the first fifty members, and one for every additional fifty. It is hardly necessary to point out that regular meetings of such a representative body are calculated materially to benefit the automobile movement by linking up the great body of motorists all over the country into one organised whole, and keeping the central organisation in touch with and alive to the desires and opinions of provincial members. This body includes leaders of the automobile movement in all parts of the country. There is little doubt therefore that the representatives of the county clubs will take steps to secure that matters in which provincial automobilists are interested are brought forward and discussed by the committee.

South Lincolnshire Motor Club.

A meeting of motorists resident in Boston and the district was held on Tuesday, December 29th, for the purpose of forming a motor club for the district. Dr. Miller, who was voted to the chair, said it might be thought that as there was a Lincolnshire Automobile Club nothing further was needed, but as there were so many motorists in Boston and the district several members of the Lincolnshire Club thought they were strong enough to form a club of their own. Further, they thought sufficient attention had not been paid by the Lincolnshire Club to the protection of the members, and they believed that a club with that as one of its principal objects would be an advantage. After discussion, it was unanimously decided to form a club with the title "The South Lincolnshire Motor Club," and that it should not be affiliated to any other body. The annual subscription was fixed at a guinea. It was decided that the objects of the club should be: (1) Primarily to form a fund to render legal assistance to members in suitable cases; (2) to further the cause of automobilism; and (3) to hold meets during the summer months. It was agreed that any motorist, whether resident in South Lincolnshire or not, or whether a member of any other club or not, could become a member, but that no member engaged in the trade should serve on the committee. Mr. W. Gartit, M.P., was asked to become president, and Lord Willoughby de Eresby, M.P., the Marquis of Exeter, the Earl of Ancaster, the Mayor of Boston (Alderman Joseph Cooke), Mr. H. R. Mansfield, M.P., Mr. G. H. Faber, Mr. E. M. Pollock, Mr. R. W. Staniland, and Mr. Meaburn Staniland vice-presidents. Dr. Miller was appointed chairman of the committee. Mr. F. Richardson agreed to act as honorary secretary and treasurer, and Messrs. South, H. C. Johnson, Mason, Crompton, A. H. Holland, and A. W. Holloway were appointed as a committee. Fifteen members were enrolled.

THE SUSSEX PLACE GARAGE.

Comparatively few people, except those who own Locomobiles, have any idea of the remarkably fine premises which were finished last year in Sussex Place. These premises now possess more than an interest to all West End motorists, as we understand the Locomobile Co. of Great Britain has been purchased by an English syndicate, of which Mr. Jarrott and Mr. Letts are directors, and it will be conducted under their supervision and to their ideas. They are making arrangements to store and warehouse cars of any description, either petrol, electricity, or steam, and, what is more, there is every facility for the requirements of these separate types, including charging plant for electromobiles, and there is machinery installed which is capable of turning out any part of a car. Users of Locomobiles need not think their interests will be neglected, as every part of the car will be kept ready for supplying at twenty-four hours notice, and there are all sorts of special appliances for making quick repairs to any make of steam car. In other words, the garage is a complete one, not only of immense extent, but with facilities for properly warehousing and keeping in order any type of vehicle. The whole building is fireproof, and the garage is provided with separate lockers for each user; in fact, it is well worth a visit from any automobilist who is interested, as the facilities provided are worth studying, even if there is no intention of making use of them. We are assured that the head of the garage will be pleased to show anyone over it, and there is no doubt that, as it is situated right in the residential quarter of the West End, it will be a very great convenience to automobilists—a convenience of which we are sure those who avail themselves will appreciate.

WOLSELEY DEVELOPMENTS.

The Wolseley Company are among the busiest of motor manufacturers. In fact, they contemplate putting on a night-shift at their Birmingham works at Adderley Park. Although building operations were in progress practically the whole of last year, it has been found necessary to commence to build new shops on the site of the trial ground adjoining the present works. During the last twelve months the average of finished cars sent out from the works was nine per week. This, of course, takes no account of the special work which was carried out by the Wolseley Company for the War Office, Admiralty, and railway companies. However, this is only a portion of the enterprise, as the new works at Crayford, Kent, which have been fitted with the most modern machinery, equal to giving an output of twenty cars per week, will be devoted entirely to the manufacture of the new six h.p. small car, the chassis of which we illustrate this week, besides other special types of vehicles. The factory and ground attached to it occupy twenty-five acres, and a track for testing cars is being laid out. This method of carrying out a prolonged road trial in the vicinity of the works has been found most satisfactory in Birmingham, as the cars can be, during a large portion of their trials, under the direct supervision of the heads of the various departments. The Wolseley factories together are now one of the largest, if not the largest, motor car manufacturing undertakings in the world.

MOTOR MAIL CARS.

Recently we illustrated a 5 h.p. Roots car, which was running between Newcastle and Sunderland, *via* South Shields, with His Majesty's mails. It works regularly each night over the road, a distance of nearly forty miles. It is a particularly good performance, as the cars were designed to carry a maximum load of three persons, with a light three-seated body. The mail vehicle, however, is fitted with a small van body, which is about three times the weight of a three-seated passenger accommodation, and above and beyond this the car has often been loaded with 7½ cwts. of mails. For over a fortnight during the rush of Christmas mails, the spare car, which was kept in reserve in case of a breakdown of the running car, has been carrying a similar overload during the day, so that both have been running day and night without a hitch. Two hundred and eighty miles each week, with more than double the normal load, is certainly about as severe a test as a car can be subjected to, more particularly when it is remembered that the road is one of the worst and most greasy in the country. The average consumption is one gallon of oil—not spirit—to sixteen miles, which works out at .31d., or, say, a third of a penny per ton mile. We are particularly glad to record the reliable behaviour of this vehicle, because the Roots oil car which ran in the thousand miles did not do itself justice. It was reported to have retired at Ospringe through chain and valve trouble on the first day. As a matter of fact, beyond delay with the chain, which repeatedly broke, there would have been no difficulty in completing the run. Owing to some misunderstanding, however, on the part of the driver—who did not realise the difference between the maximum time for the day's run and disqualification—the machine was withdrawn. The exhaust valve trouble was wrongly described as such. It was simply the exhaust pipe which broke, and the brazing of this could have been done by any motor agent in a very short time.

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 the 31st December, 1903. All notices of opposition to the grant of patents on the several applications should be filed not later than the 16th February, 1904.

1902.

27,123.—P. Schwehm. Two stroke cycle internal combustion motor.

27,735.—A. Kinder. Steering gear with pivots contained in the wheel hubs.

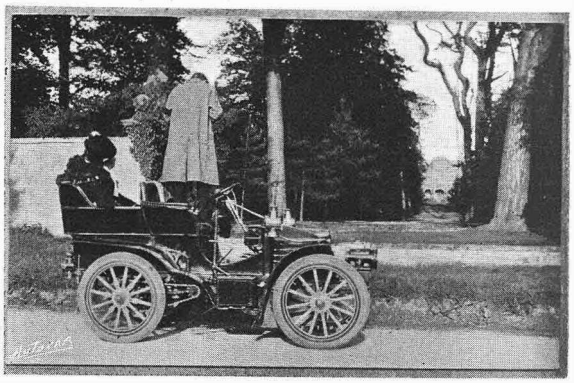
1903.

473.—J. Ridley and the Ridley Autocar Co., Ltd. Reversing gear for cars fitted with clutches instead of a differential.

475.—A. W. Wall. Motor cycle frame and method of securing tank, etc.

526.—E. Field and E. J. Hunt. Explosion motor with water injection into cylinder.

744.—G. F. Emery and G. Rodwell. Portable stand for motor cycles.



A SUBSTANTIAL CAMERA STAND. Photographing Guy's Cliff, near Warwick, from a 7½ h.p. Wolseley. Guy's Cliff is one of the many spots which attract so many visitors to Shakespeare's country. We are indebted to Mr. C. S. Baynton, of Birmingham, for the photograph.