

exactly as ordered, and have suffered by loss of trade in consequence of so doing. Again, it is no uncommon thing for orders from over seas to come to hand in which it is really extremely difficult to make out what the sender really does want. We adduce these facts not with any intention of finding fault, but to show that there is a reverse to the shield. If only our colonial friends would follow the example of one or two well-known and successful firms that we could mention, by only dealing with well-known firms of integrity and by sending them an account of their requirements as regards the work to be done and the conditions under which it has to be effected, relying on them to execute the order to the best of their judgment, we would hear fewer complaints of orders unsatisfactorily fulfilled.

The British Motor Trade at a Glance.

Below we give particulars relating to the number and value of imports and exports of motor cars and parts thereof for the first month of the years 1904-5-6. The increase for January of the present year is very great, both in imports and exports. The demand shows no diminution, but emphatically the reverse.

Eight times the value of parts of cars are imported as compared with exports, whilst the re-exports of the foreign parts are only about one-fourteenth of the imports thereof. Still, whatever way we look at it, the prospects of rapid expansion of business are most encouraging, and show that the industry is well on its feet, and that British motor manufacturers are slowly gaining ground.

TABULATED BRITISH TRADING RESULTS OF THE MOTOR CARS AND PARTS THEREOF FOR JANUARY OF THE LAST THREE YEARS.

	IMPORTS.			BRITISH AND IRISH EXPORTS.			FOREIGN AND COLONIAL RE-EXPORTS.		
	Month ended 1st January.			Month ended 1st January			Month ended 1st January		
	1904	1905	1906	1904	1905	1906	1904	1905	1906
CARS—									
Number	335	362	458	55	77	146	35	50	68
Value	£102,866	£149,578	£175,270	£25,166	£25,590	£48,759	£9,223	£19,006	£26,999
PARTS—									
Value	£17,906	£36,608	£136,720	£3,470	£7,480	£16,334	£1,011	£2,733	£9,582

The Turner-Miesse Generator.

The generator of the Turner-Miesse steam car, which is of the flash type, is built of a number of layers of solid drawn steel tubes, each tube being bent into a special shape. There are sixteen layers in all, laid horizontally one above the other, and each layer being at right angles to the other and each four layers connected together by outside unions. The water enters the bottom layer first and finds its way up through 8 layers, and from the 8th layer it passes to the 13th layer, and up until it reaches the 16th layer. From the 16th layer it drops to the 9th, and passes up to the 12th layer, leaving same as very highly superheated steam and passing to engine. The lowest tubes may thus be considered to act as a feed-water heater, and are therefore not liable to become burnt under ordinary working conditions. The top layers receive less heat from the burner, and may be called the steam raising coils. The intermediate coils may in the same way be looked upon as the superheater portion of the boiler. The tubes vary in thickness, although the external diameter throughout is $\frac{3}{4}$ ", those at the bottom have an internal diameter of about $\frac{5}{16}$ ", and the superheated coils of about $\frac{7}{16}$ ". In the 10 h.p. generator the total length of tube is about 200 feet, and in the 16 h.p. car, roundly 300 feet. The generator is enclosed in a special casing, built up with an inner and outer sheet of steel, held together by channel steel frames top and bottom the space between the metal sheets being filled up with asbestos. The long rectangular holes in it are made to form the bottom of a horizontal flue, a second bent plate being fixed above it. This flue runs out through the bonnet in front, and is connected with a vertical flue passing down between the generator casing and dashboard, the burnt gases passing out through it beneath the car.

The generator, which is tested to a pressure of 1,200 lbs. per square inch, is fired by a special form of burner which uses ordinary paraffin as fuel. The latter is carried in the air-tight tank, the feed pipe from it is led to a shut-off cock on the left-hand side of the car. A pressure of about 70 to 75 lbs per square inch is main-

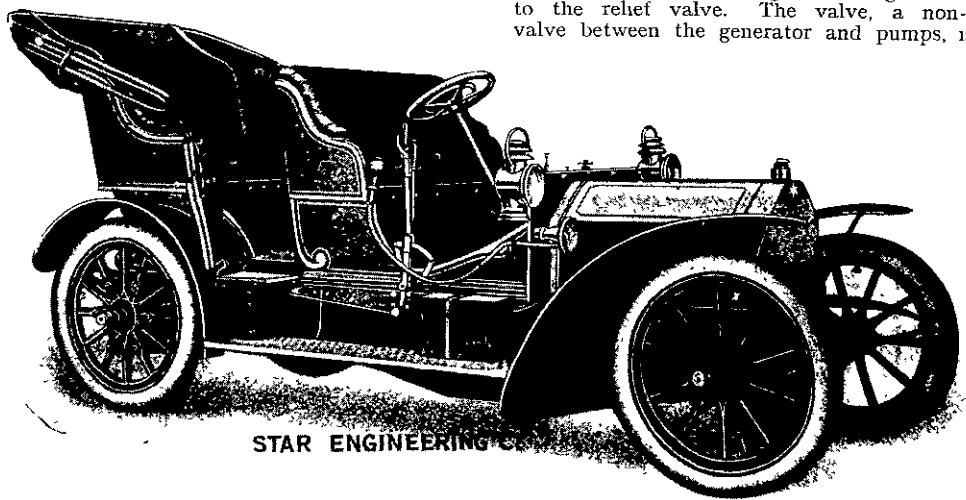
tained in the tank by a mechanically driven air pump, worked directly off the crank shaft of the engine. The delivery pipe from the pump is led to a three-way cock, which is connected with a gauge showing the pressure in the fuel tank, and with a relief valve on the dashboard. The three-way cock has a nozzle to which can be attached an ordinary tyre pump for obtaining the necessary pressure initially. The fuel finds its way into two vaporiser coils which lie above the burner, and then to the burner nozzle.

The quantity of gas which is fed to the burner is regulated by the amount of air pressure on top of paraffin in paraffin tank. No regulator for the air is provided, the air and gas pass along the pipe into a chamber from which a large number of parallel horizontal tubes project beneath the boiler. The tubes are perforated with rows of fine holes, drilled at an angle, which form the burner jets. The oil enters one end of the vaporiser which rests directly on two of the main burner tubes, passes through the various spirals and emerges at the other end as vigour. The burner is placed in line with hole in the casing, through which the flame of the pilot light is introduced. The vaporised oil passes through the pipe to the burner jet. The vaporiser has an internal bore of $\frac{5}{16}$ " and an external diameter of $\frac{9}{16}$ ". An inspection hole in the generator casing allows the operator to see when the coil is sufficiently heated by the pilot light to permit the paraffin cock to be opened.

The tubes are perforated, the two external tubes having but one row of holes in them and tubes two rows. The mixture of gas and air issues out of these holes at an angle of 45 degrees, and the flames from each adjacent tube strike one another and cause the heat gener-

pilot light before attempting to start the burner with its ordinary fuel. The operation of heating up takes something over five minutes to perform, but should not be hastened unduly, as the burner is liable to smoke, if the coil is not sufficiently hot. The burner appears to work well and quietly, and to give a very high degree of heat.

The water is forced into one end of the generator either by a hand pump, when starting, or by a mechanically driven pump when the car is running; in the latter case the quantity of water delivered depends upon the speed of the car, but the actual amount which finds its way into the generator is regulated by hand, any surplus being allowed to find its way back to the supply tank. The hand regulator consists of a by-pass, and it primarily enables the driver to regulate the steam pressure. From the water tank the water is led to the feed pumps, its passage to the pump cylinders being regulated by a shut-off cock. A small dome is placed on the top of the tank on the right hand side, and an overflow which passes down through the water and out at the bottom of the tank, terminates at its upper end inside this dome. One of the delivery pipes from the pumps is led to a by-pass valve, which is also connected back again to the suction side of the pump. The by-pass is controlled by a small lever working over a toothed quadrant attached to the steering column under the steering wheel, and the quantity of water delivered to the boiler can thus be regulated. The delivery pipe from the pumps to the boiler has an additional non-return valve between it and the pumps. It passes direct to the bottom coil of the generator, and has one branch pipe which leads through a relief valve, which forms a part of the quadrant on the steering pillar. The relief valve is normally kept closed, but in the event of the pressure rising abnormally at any time, it can be opened by the driver, when the water or steam in the delivery pipe will be allowed to pass to the condenser. The feed water pumps are fixed on the right-hand side of the car and are formed in one casting. One of them is operated by the hand lever, and the other by the eccentric on the countershaft. An air pump is fixed to the left of the engine, and is driven by a crank pin on the crank shaft. The other end of the shaft carries a hand brake controlled by a foot pedal; the latter also operates the steam throttle valve, its action being to first cut off the steam supply to the engine, and on further depression to apply the brake. The two water pumps have separate suction and delivery valves. The water passes from the pumps to the hand controlled by-pass, and through an additional delivery valve and pipe fitting in order to go to the generator and to the relief valve. The valve, a non-return valve between the generator and pumps, is thus



14-18 HP 4-CYLINDER STUART CAR SIDE ENTRANCE AND HOOD

ated to be equally diffused. The burner is held in position by two butterfly nuts at the front of casing, and the central tube of burner which is somewhat longer than the other, is slid through the hole in back of casing and fastened with a wedge-shaped cotter and split pin. The mixture supply tube lies outside the burner.

All the tubes are, of course, closed at their rear ends. The 10 h.p. burner has seven tubes and the 16 h.p. nine. Even the smaller burner has over a thousand small holes in its tubes. The hole through the nozzle is extremely small, being about $\frac{1}{16}$ " in diameter. The burner can be easily taken out when necessary, the pipe connection to the nozzle and the cotter behind the generator casing, together with the two butterfly nuts alone require removing, when the burner can at once be dropped. The vaporising coil of the burner is initially heated up by a pilot lamp and subsequently kept hot by the burner itself. The vaporiser coil requires to be thoroughly heated by the

provided which prevents the steam pressure forcing water or steam back through the by-pass and the condenser to the water tank.

An interesting trial is being conducted under the auspices of the Automobile Club, London, of an invention designed to obviate the use of the differential gear, which, if it fulfils the claims of the inventor, is destined to play a not unimportant part in the development of the motor car. Briefly, Mr. Hedgeland, instead of using the ordinary differential, has a solid axle upon which he mounts the wheels on clutches. These differ from the ordinary clutch in that as soon as the drive is exerted either forward or backward a coarse-cut thread immediately comes into operation and locks the wheel on to the axle, thus taking the strain from the clutch. The effect of this is that on turning corners one wheel is allowed