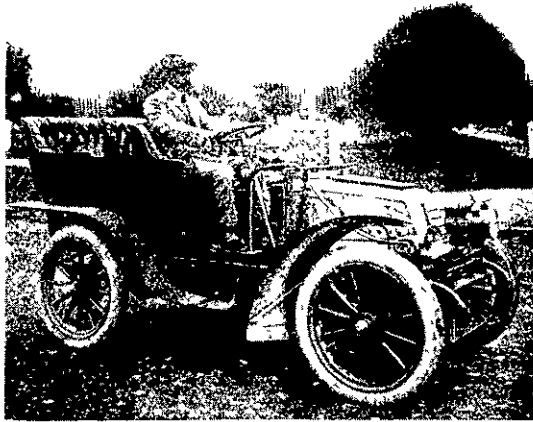


cipede, all the power exerted by the animal's muscles is applied to the propulsion of the vehicle. The pull exercised by the animal in the horse velocipede is used quite as much as in ordinary horse-drawn road vehicles, but an increase of efficiency is obtained by the utilisation of the friction of the hoofs on the apron. With road vehicles of ordinary construction, this friction of the hoofs on the track is not utilised. The speed of the velocipede also may be increased or lowered as desired, without accelerating or diminishing the movement of the equine motor. It is also claimed that the invention acts as a safeguard against animals likely to take fright or bolt. The animal is walking on a fixed, endless apron, which moves on rollers, and so transmits the power to the surface, which acts as a pulley on the wheels. Of course, the vehicle is made a little heavy by the weight of the animal. Analysis, however, has proved that the frictional resistance of vehicles on an even, good road is 1-40th, and on very bad roads 1-10 of the weight of the vehicle; therefore, on an average only about 1-25th or 4 per cent., which is exceedingly low, and, considered in relation to the gain arising from the expenditure of the greater proportion of the power of the horse in propelling the vehicle, shows what an enormous saving of energy is gained by using a horse in so doing rather than in drawing the vehicle.

The excess power so obtained can be brought into play by giving the vehicle greater speed; secondly, by facilitating the work for the animal, and the inventor considers he will further lessen the dead weight of the animal by a hanging spring belt, where the roads are good and the load small, so that the endurance of the horse will be exceedingly greater.

By two or more speeds in the transmission and by friction wheels the speed of the animal is varied,

of the country, and bad roads with innumerable short turns, some of his "times" are remarkably good. For instance, a few days ago, Mr. Nathan



MR. F. J. NATHAN, PALMERSTON NORTH, AND HIS 12-H.P. TWO-CYLINDER DE DION.

left Palmerston at 12 o'clock, and, in spite of several stops necessitated by frightened horses, arrived at Wellington Post Office at 4-15. About 8½ gallons of petrol spirit were consumed on the journey to and fro, so that the car appears to be fairly economical.

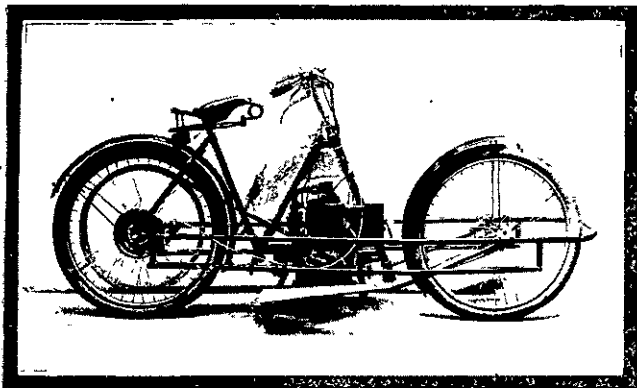
Argyll Motor Works.

We are able to show on this page, through the courtesy of the Scott Motor and Cycle Co., two views of the interior of the new Argyll works at Alexandria, near Glasgow. A visitor describes the machine shop in the following terms —

"It was imposing indeed to view the forest of columns and the long perspective lines of girders supporting the nine dentated bays of roofing, each bay 30ft. to 33ft. broad, and 200ft. long, and to realise that every atom of the metal work was of British manufacture, and that no Belgian makers had been allowed to apply. The lines of shafting in this huge shop are driven by three four-cylinder Rodger-Rowden gas engines, each of 100 h.p., either pair of the engines being of sufficient power to take the whole shop at full load. A considerable portion of this area is put down as a tool shop where the money is spent, lost and made. The tool shop, however, is only separated from the rest of the machine shop by open work wire screens. The whole of this shop is warmed and ventilated on Sturtevant's hot-air system, and in cold weather, which occurs thereabouts at times, the fresh air inlet can be closed as required, and the air in the shop circulated to keep it from growing stagnant. The shop is electrically lit by C. Hamilton Ltd., of Glasgow. In connection with this interesting installation is a special power house for electrically driven fans, three being apportioned to the machine shop. The floor will accommodate between 400 and 500 machine tools; and when

in full swing 400 men will be busy beneath the nine-bayed roof. All the workers in the factory are to adopt and wear a form of khaki uniform smock whilst at work, and this uniformity of costume, so much neglected elsewhere, will tend to make the Argyll works one of the show places of British manufactures."

Amongst the many varied uses to which the industrial motor vehicle is put none are perhaps more useful or interesting than in conjunction with vacuum cleaner plants, which have revolutionised theatre, hotel, public building, and house cleaning even as industrial motor vehicles have revolutionised road traction systems. We have received from the British Vacuum Cleaner Company, Limited, of 25, Victoria street, London, S.W., the following particulars relative to the three motor vehicles employed by them in their business. All these vehicles were manufactured by the famous firm of John I. Thornycroft and Co., Limited, of Chiswick, Basingstoke, and Southampton. The vehicles consist of two steam wagons and a self-contained petrol van. Each of the vehicles are of 20 brake-horse-power. The normal load capacity of the steam wagons is 5 tons each, and they are used to carry cleaner plant, and packages of goods to be cleaned weighing up to 3 tons. The maximum load of the petrol vehicle is 3 tons, and it carries the fixed cleaner plant and five men. No record of the actual daily mileages covered by the vehicles is to hand. They are used regularly, however, the steamers 5 days weekly, and the petrol van 6 days weekly. Each of the steam wagons has two attendants, the petrol van has one regular attendant, besides the four men who conduct the cleaning operations. No vehicle



NOVEL MOTOR BICYCLE: THE ZENITH.

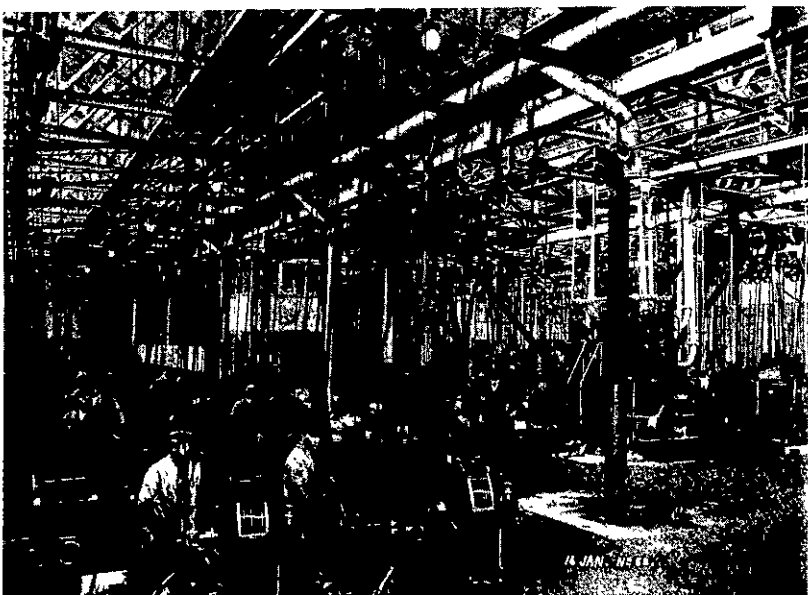


ZENITH TRI-CAR.

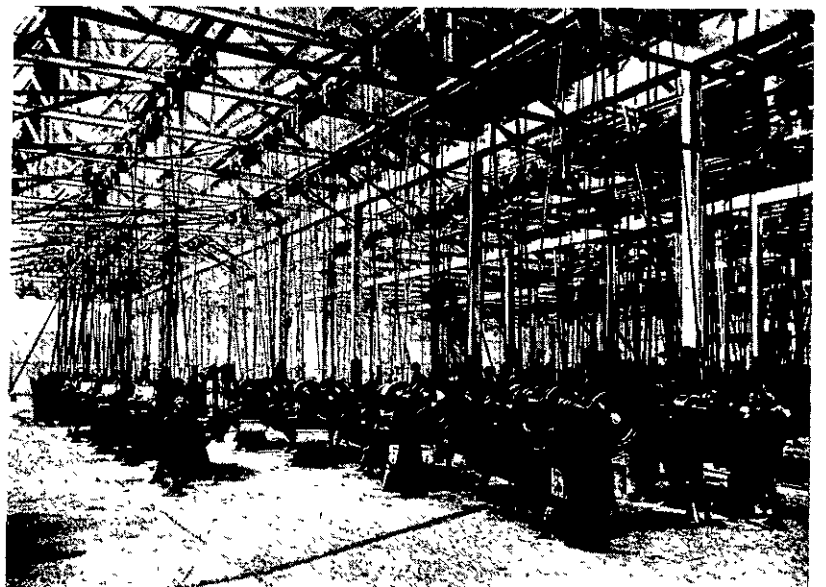
and can also be entirely stopped at will, as, when an animal makes a nasty movement or attempts to bolt, all the power exercised can immediately be rendered inoperative. When descending hills, the animal will be able to rest after the exhausting ascent, and so by its own weight serve to continue the forward movement of the vehicle, which can also be stopped at will by brakes.

Mr. F. J. Nathan, of Palmerston North, has travelled some 5000 miles upon the De Dion car shown in our illustration, without mishap of any kind. Trips from Palmerston, Wanganui and Wellington are a frequent occurrence with Mr. Nathan, and taking into account the hilly nature

is kept in reserve, the steam wagons, as before stated, working 5 days per week, the sixth day, Saturday, being taken advantage of for washing down. The petrol van is attended to as circumstances demand, no special days being allotted for washing down. Steel tyres are used on the steam wagon wheels, and Royal Sirdar Buffer solid rubber tyres on the wheels of the petrol van; twin tyres on the back and single tyres on the front wheels. The rubber tyres are doing excellent service, and no renewals of course have yet been rendered necessary. The work performed by the petrol vehicles was previously done by horses and vans. The change from equine to motor traction has been eminently successful, as can be seen by anybody who has observed these notable vehicles operating in and around the metropolis.



MACHINE ROOM, ARGYLL WORKS.



AUTOMATIC MACHINE ROOM, ARGYLL WORKS.