

TWENTY-PASSENGER AUTO-STAGE FOR LONG-DISTANCE ROUTES.

The large twenty-passenger stage shown in the annexed engraving is built by the Mack Brothers Company, of Brooklyn, N. Y. It is intended for carrying passengers long distances over roads, and on good roads a maximum speed of 25 miles an hour can be obtained. The car is driven by a four-cylinder $5\frac{1}{2}$ by 6 gasoline engine, having mechanically-operated inlet and exhaust valves in single chambers at the side of each cylinder, and operated from a single cam shaft. Jump-spark ignition from a single vibrating coil is used. The current is supplied by dry batteries, and the secondary current is distributed to the various plugs by means of an Altemus distributor. A finned tube radiator of the usual type is employed, the water being circulated by a centrifugal chain-driven pump. A novel feature of this car is a compact device containing a powerful spring, which is wound up by the motor when it is running, and the energy of which is used to turn

does not need to be placed on the floor. This patrol wagon shown is being used by the Springfield, Mass., police department, and is giving entire satisfaction.

THE BRUSH MOTOR OMNIBUS.

The omnibus has been almost entirely superseded by the tram-car, but in sparsely-populated districts, where laying an expensive permanent way is not commercially practicable, there is a growing demand for motor omnibus services, by means of which passengers may be conveyed to the tramway terminals or the railway station.

The Brush Electrical Engineering Company, of Loughborough, England, has specially designed the vehicle illustrated for districts in which the traffic is small. The main feature of novelty is the transmission gear, which is of the individual clutch type.

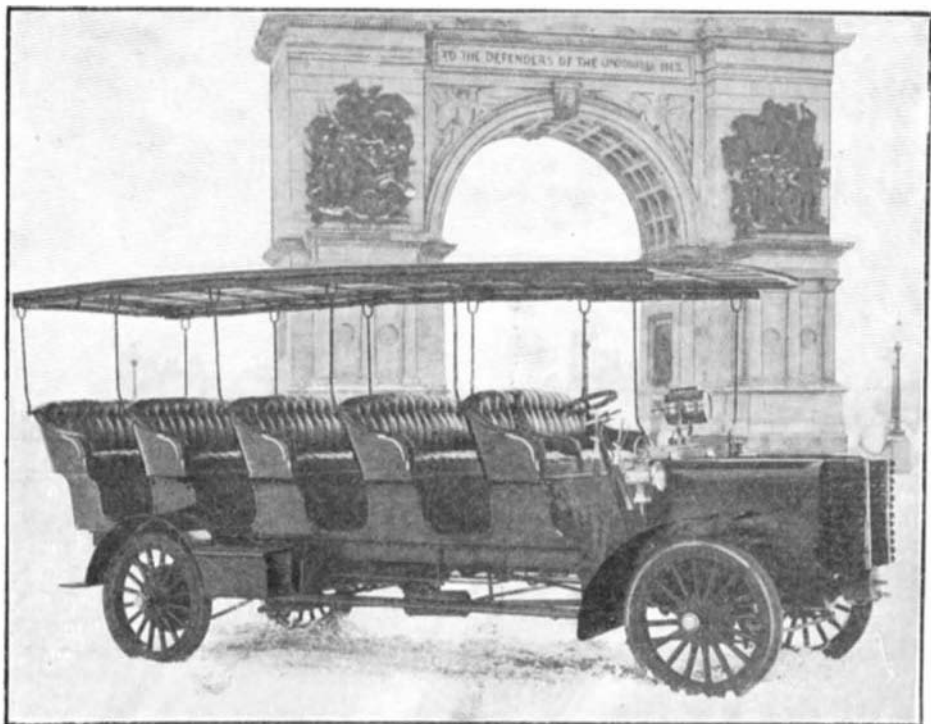
With this type of transmission it is evident that when changing speeds, nothing but a simple movement of the lever is required; and as friction clutches are

lutely the cheapest form of passenger traction for thinly populated districts.

The advantages claimed for the system are the following: The change of speed is effected with the utmost simplicity, smoothness, and safety. There is no possibility of missing the striking of any gear desired, either in ascending or descending hills, as the gears are always in mesh. No jolting or jerking accompanies the increase or decrease of speed. Any omnibus driver can take charge of the vehicle after a few minutes' instruction, without any danger of his damaging the mechanism or losing control. If both brakes were to fail, the omnibus would be able to descend the steepest gradient at walking pace on its lowest speed. The reverse may be readily thrown in while the car is running forward on the second and top speed, which is specially advantageous in crowded streets.

THE NEW OLDSMOBILE DELIVERY WAGON.

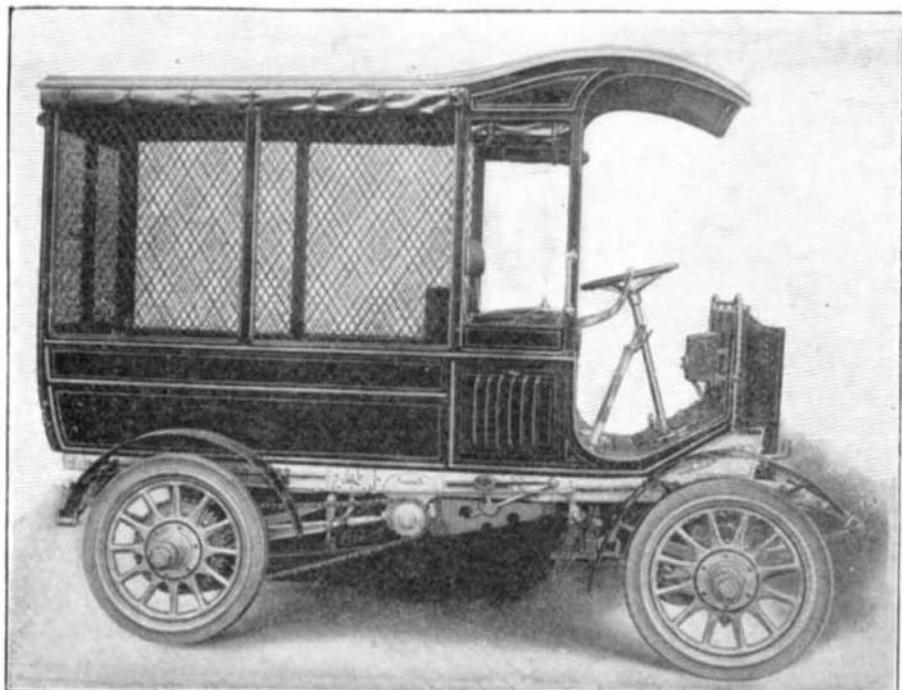
Besides a new double opposed-cylinder side-entrance



The Manhattan Twenty-Passenger Auto-Stage.



An English Motor Omnibus.



Oldsmobile Delivery Wagon Fitted with 16-Horse-Power Vertical Motor.



Knox Patrol Wagon Propelled by 16-Horse-Power Horizontal Air-Cooled Motor.

SOME NEW TYPES OF COMMERCIAL VEHICLES.

the engine over a number of times, in order to start it. This device does not interfere with the operation of the motor in any way, nor with its being started by hand, if found necessary. It can be fitted to any gasoline engine. The twenty-passenger stage shown was exhibited at the recent Automobile Show in this city, and we are told that several of these stages are to be used in a daily service between Philadelphia and Atlantic City, and Atlantic City and Asbury Park, during the coming summer.

A GASOLINE POLICE PATROL WAGON.

The Knox Company has recently produced the first American gasoline police patrol wagon, the general appearance of which is seen from the accompanying cut. The body is mounted on a standard double opposed-cylinder chassis. It is 5 feet 9 inches high inside, and under the usual seats running lengthwise on each side there is sufficient locker space to carry a stretcher, emergency kit, etc. The stretcher is fitted with four ball knobs, which drop into slots on the edges of the seats, so that it can be suspended, and

the means of transmission, there is no need to work the foot clutch when changing gear. Sudden shocks such as are experienced with other types of gears are entirely avoided, thus effecting a great saving in wear and tear, and a great reduction of vibration throughout the whole frame. The life of the tires is said to be also considerably extended owing to the increase of speed being gradual, thus preventing the ripping action due to wheels suddenly brought into mesh as in the ordinary gear.

The engine develops 30 horse-power at about 900 revolutions per minute. The bore of the cylinder is 110 millimeters (4.33 inches) and the stroke 130 millimeters (5.118 inches). The drive is by universally-jointed shafts to gear rings on the inside of the driving wheels.

The entrance to the omnibus and the method of paying fares when passing the driver, obviate the necessity of employing a conductor, and the saving in wages may be just sufficient to make the enterprise profitable. This type is therefore suitable as a feeder to railway and tramway systems, as it affords abso-

tonneau, the Olds Motor Works, of Detroit, Mich., have this year brought out the gasoline delivery wagon illustrated herewith. A type of motor new to the Olds Company is used on this car. This is a double-cylinder vertical engine situated under the driver's seat. This location of the motor makes it possible to use a longer body without increasing the length of the car, and, at the same time, the valves and other mechanism can be readily inspected or adjusted by removing the seat. The motor drives a countershaft, placed directly behind it, through a Morse silent chain; and the drive from the countershaft to the rear wheels is by side chains. The countershaft carries a planetary gear transmission containing bronze and steel gears running in oil, and giving two speeds ahead and a reverse. Expanding ring brakes are fitted on the hubs of the rear wheels, and there is also the usual band brake on the transmission. The former are controlled by a lever, and a pedal operates the latter. A tubular radiator is used with this car, the circulation being maintained by a positively driven gear pump. The motor is thoroughly