THE OVERMAN STEAM AUTOMOBILE.

The steam carriage built by the Overman Automobile Company, of Chicopee Falls, Mass., might almost be called a Franco-American vehicle, since the mechanism has the complexity of detail of the French machines, while the Yankee ingenuity of the New Englander is seen in the invention and method of assembling the parts. The carriage has been thoroughly tested during the last year; and many of the parts are now built stronger than heretofore, while the machine as a whole weighs more than last year's model.

The manufacturers of this automobile have incased its machinery as far as possible in a pressed steel body, which has the obvious advantage of being indestructible by fire. The side panels of the body below the seat can be opened, and the seat itself raised, thus allowing the machinery to be easily reached when necessary.

The principal points of interest in this carriage, which distinguish it from most other steam machines, are the automatic water feed regulator and various other similar devices, such as steam, water and air pumps, fusible plugs for putting out the fire in case of low water in the boiler, etc.

The water feed of the boiler is controlled by a thermostat, the construction and operation of which is shown. A U-shaped brass pipe, *B*, is connected at the upper end to the steam space of the boiler and at the lower end to the water space, so that the upper half is normally filled with steam and the lower half with water. This water is kept cool by a jacket, *C*, through which the feed water from the tank is pumped before going to the feed-water heater. On each side of the upper part of *B* are guide plates, *A*, in the ends of which the rod, *R*, is mounted. This rod runs forward along the side of the carriage and carries a finger, *F*, adapted to raise or lower the by-pass valve, *P*. *D* is a tongue soldered to the tube, *B*, at its upper bend and acting on *R* through the arm, *E*. When the water level rises in the boiler, the cool water enters the upper part of *B* and causes it to contract. This contraction is sufficient, when multiplied a few times by the lever arrangements, to open the bypass valve, *P*, and allow the water to be pumped back into the tank. In like manner, when the level falls, the bypass valve is closed.

The pump used to supply the boiler differs from those usually employed in that it is of the double-acting, slow-running type, and is driven by the back axle instead of by the engine. A small gear on the axle drives a larger gear that carries a crank pin. Fastened to the crank pin is one end of a long rod, the other end of which is attached to the pump. By the rotation of the gear carrying the crank pin, the rod and pump are given the necessary reciprocal movement. The water is heated before entering the boiler by passing through a 48-foot coil of copper tubing inclosed in a shell through which the engine exhausts.

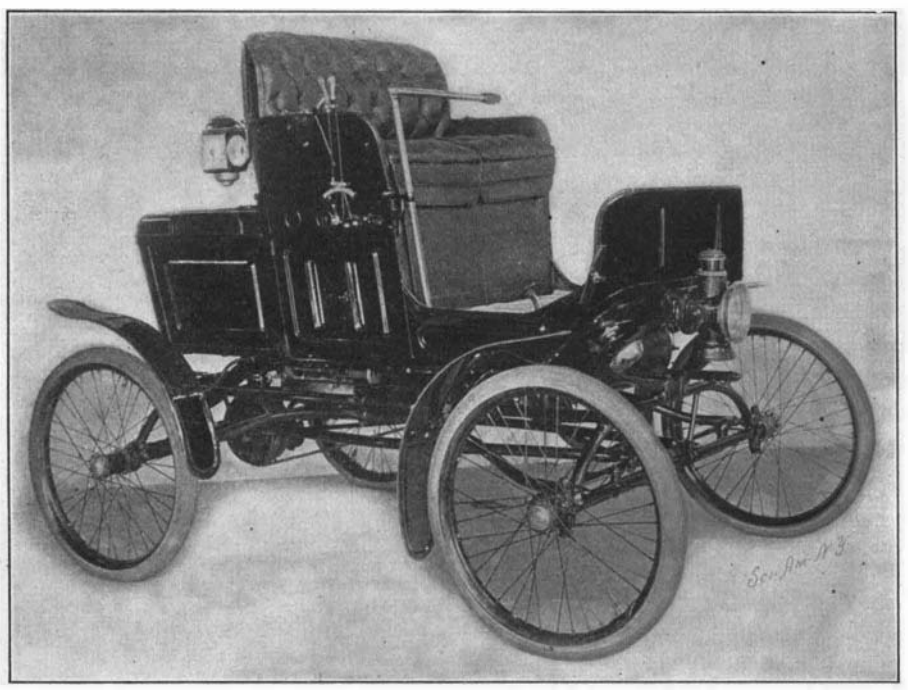
An injector is conveniently placed for filling the water tank when on the road. With the tank full of water, valves may be opened, and the water allowed to run into the boiler to the proper level, should the latter be empty and without steam. This is a very convenient way of getting water into the boiler.

The steam water and air pumps are started by turning a small lever beside the seat either forward or backward. The lever is on the end of a rod that runs across under the seat and carries a small eccentric at a point near the pumps. The eccentric raises or lowers a rocker arm, that serves to open the valve to either the air or water pump. Besides being thus under the control of the operator, the air pump is also furnished with a pressure diaphragm regulator which starts and stops it automatically should the pressure in the fuel tank fall four pounds.

The boiler and burner are of the usual type. The latter is started by burning some wood alcohol in a trough that runs across it beneath the main vaporizing tube. The alcohol is introduced through a funnel situated inside the panel below the driver's seat. The gasoline, before passing through the vaporizing tube, circles around the inside of the burner through a coil of pipe, where it is initially heated.

The burner flame is controlled by the usual pressure diaphragm, but there is also a flame accelerator that can be operated from the seat and by which the flame can be increased if more heat is needed, as in climbing a bad hill. The boiler is provided with a superheating coil which is situated in the combustion chamber directly over the flame.

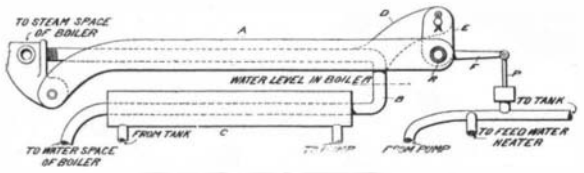
Should the water run low in the boiler, the steam will melt a fusible plug and close a valve, thus shutting off the gasoline and extinguishing the fire. This will happen while there is still two inches of water in the boiler, so that the chances are very slight of the machine ever being laid up from a burned-out boiler.



OVERMAN STEAM AUTOMOBILE.

The boiler has two water glasses also (one inside and one outside of the body), so that the water level can always be ascertained. Should either of the glasses get broken, back check valves immediately close and shut off the water and steam. A third glass indicates the water level in the tank.

The engine of the Overman carriage is of the piston-valve type, and has the cranks completely inclosed and running in oil. Plain bearings are used throughout. The cylinders are 2½-inch bore by 3-inch stroke. The engine is mounted on hollow trunnions which form admission and exhaust pipes respectively, and its lower end can be swung forward for tightening the chain. The exhaust from the engine is run into the tubing of the frame, whence it issues into the atmosphere through a series of small holes.



WATER-FEED CONTROLLER.

An auxiliary third gage shows the amount of gasoline in the tank. At night, by pressing a button, all three gages can be illuminated by a small electric light; and although the presence of the automatic feed water regulator renders inspection of the water glass unnecessary, this too can be instantly illuminated by pressing another button. It will thus be seen that this carriage is complete even to the minutest detail, and has all possible devices that are known at present for the comfort and convenience of the operator.

THE GROUT QUEEN STANHOPE.

The cut shows the latest production of Grout Brothers Automobile Company, Orange, Mass. The straight lines and curves appearing in this style are combined to make a most pleasing and well-proportioned carriage. Handsome top, mud-fenders, and attractive side lamps show that it is well equipped, with wide body and seat and standard wide tread.

Most important, however, are the motive parts; the yoke inclosed compensating gear is drop-forged; the engine is of heavier construction than usual. The eccentrics and sprockets are drop-forged in one piece, thereby replacing the thirteen separate parts heretofore required. All tanks are seamless, the brake double-acting. The gasoline tank has capacity of 7½ gallons; the 36-gallon water tank is fitted with an indicator. A steam ram fills water tank in five minutes, taking water at 40 degrees F., the operation raising it to 140 deg. The water passing then through heater is very nearly 212 deg. when finally it reaches boiler; thus it will be seen that the Grout vehicle is also economical in operation.

THE GROUT STEAM STANHOPE.

An interesting test of military automobiles has lately been carried out in Germany. The Daimler Company, of Cannstadt, had received an order from the government for a number of tractors, and when they were finished a party of officers and men undertook to pilot them from Cannstadt to Berlin over the road. There were eight of these tractors in all, and each could transport a net load of half a ton. Seven of them were operated by gasoline motors and the eighth had an alcohol motor. The party included a captain, two lieutenants and 34 under-officers, together with the soldiers of the testing department of the Berlin Transportation Board. They started out in good order and at first the weather was favorable, but soon after the temperature lowered and the routes became frozen. This made the journey very difficult and was at the same time a good test of the machines. The grades are steep in that region, and it was only with great difficulty that the tractors could be made to pass over the frozen roads. Besides, the conductors had not acquired the experience necessary to make the vehicles operate with entire satisfaction. The trouble caused by the slipping of the wheels was overcome by applying an ingenious idea. The wheels were provided with iron tires, and it occurred to some of the party to equip these with points in order to avoid slipping. This was accordingly done, and it was found to be a great improvement. The most difficult part of the trip was in going through the Thuringen Forest, where they encountered a driving snow which greatly impeded their progress. However, they were successful at last, and after a voyage full of incidents they were able to reach Berlin. The various difficulties which had to be overcome during the trip served to bring out the good qualities of the mechanism, and in fact the tractors showed good resistance throughout. Another series of tests of military automobiles is that which has been made recently in Italy, and the Etat Major are considering the question of adopting one or more types of automobiles for the army, these to be used by the officers and for the transport of loads. During the last grand maneuvers an omnibus was used to furnish the transportation service for the general commanding the division and his staff during twelve consecutive days. In spite of the bad weather and muddy roads the tests proved quite satisfactory. The omnibus used weighs 2,200 pounds and has a Bolide gasoline motor of 15 horse power.

The German Emperor has offered a prize for a motor car suited for the purposes of the farmer. The award will be made some time next year by the Emperor himself.