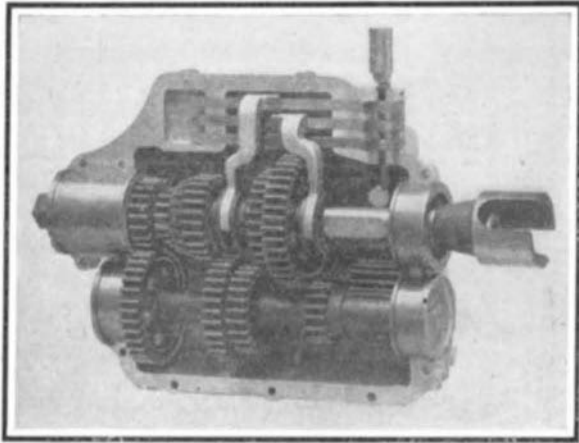


A DETACHABLE LIMOUSINE TOURING CAR.

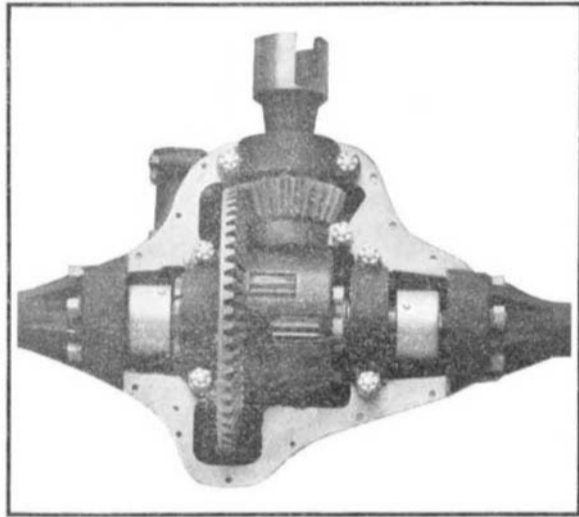
A strong, well-built touring car having a detachable limousine top and several other novel features, is that made by the Welch Motor Car Company, of Pontiac, Mich. This machine has a standard $4\frac{1}{2}$ x 5-inch four-cylinder motor, having a range of from 150 to 1,800 R. P. M., and rated at 30 to 36 horse-power. The top view of the motor, shown herewith, gives a good idea of the arrangement of the valves in the cylinder heads. The latter are made as near spherical as possible, so that the wall surface exposed to the flame is about one-third less than in the usual motor. This arrangement allows of the charge entering the cylinder quickly and in a cool condition. A full charge is drawn in and expelled from every cylinder during each two revolutions of the crankshaft. This form of cylinder and arrangement of valves is similar to that of the Fiat engine, which, it will be remembered, made such a remarkable performance in the Vanderbilt cup race last October. The burning of the charge is said to be quicker and more complete in a spherical combustion chamber, as the flame does not have to travel more than one-fourth as far as it otherwise would, in order to complete the ignition of the charge. Furthermore, the loss of power through the absorption of heat by the cooled cylinder walls is also largely cut down. On account of these facts, the makers claim 20 per cent more power than is obtainable with motors of the same size and of the usual construction. The perfect combustion of the charge and the straight exit it makes through the valve in the head eliminate all exhaust valve troubles, and make the motor particularly reliable.

The transmission used on this car has its gears always in mesh; but, by means of individual, multiple-disk clutches, no gears are running on the high speed. There are but two speeds forward and a reverse. Two multiple-disk clutches, of 150 square inches friction surface each, and a sliding jaw-clutch, are used to obtain these three speeds. All speeds are obtained with a single lever at the right of the driver, and the car can be thrown instantly from the high speed into the reverse.

A novel feature of this car is the arrangement of the pump (which is of the centrifugal type) in the center of the honeycomb radiator. The spindle of the pump projects through at the back of the radiator, and has the fan mounted upon it. A pulley on the hub of the fan is driven by a belt from a corresponding pulley on the crankshaft. The valves



The Peerless 4-Speed, Selective-Type Transmission.



The Peerless Bevel Gear Drive, Showing Spur Gear Differential with Ball Bearings and Universal Joints on Each Side.

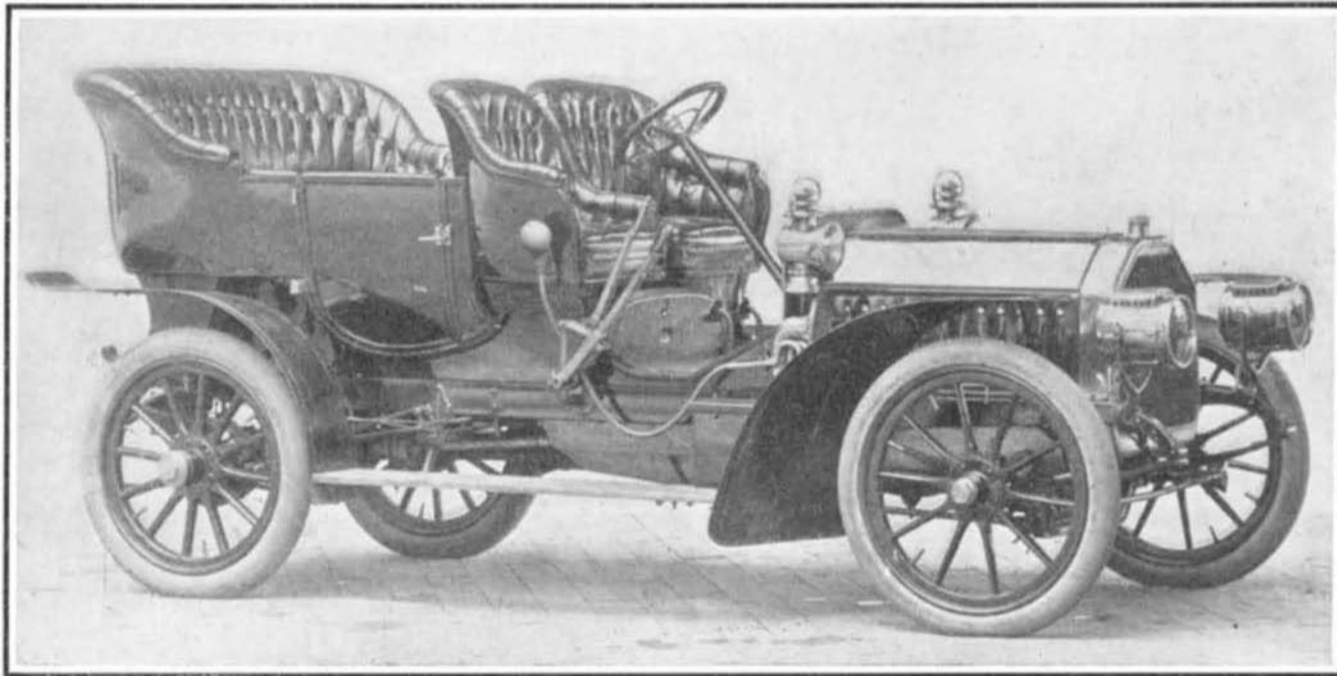
of the motor, which are set at an angle of 45 degrees, are operated by a central camshaft running over the cylinders and driven by bevel gears from the crankshaft. The timer is also located on a vertical bevel-gear-driven shaft, at the forward end of the motor. High compression is used in this engine, and is said to make it very efficient.

The radiator contains 13,500 square inches of radiating surface. It is made up of seamless brass tubing, and, although all the tubes form a solid mass, any one tube can be easily removed and replaced, if necessary. If the pump should cease to work, the radiator would still operate on the thermo-siphon principle. This car is noted for the use of plain bearings almost throughout. These are very generous in size, and are made invariably of steel on bronze, each bearing being automatically flooded with oil. A telescopic steering post is one of the novel features of this machine, and is an arrangement which adds greatly to the comfort of the driver in getting in and out of the car. The Welch machine is one of the largest and most handsomely finished American touring cars. Besides the novel features in its construction, the fact that the closed limousine top may be removed wholly or in part makes it a particularly useful car for all-year service.

THE PEERLESS 30-HORSE-POWER TOURING CAR.

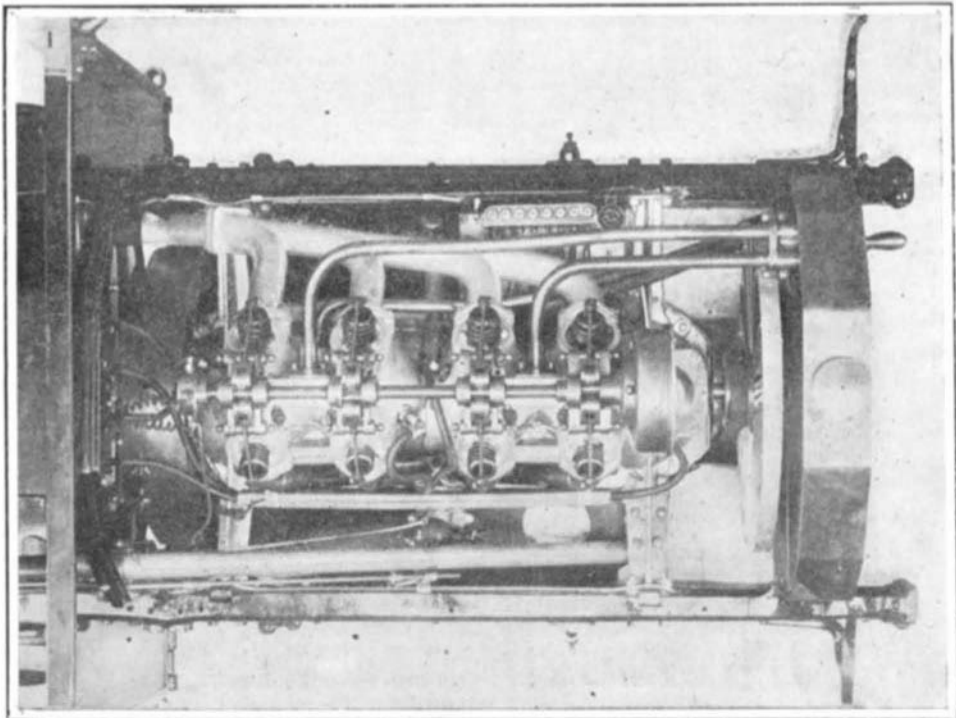
The new touring car put out by the Peerless Company, while having no very radical changes over last year's machine, has been improved in various places and brought thoroughly up to date. The cylinders of the motor are cast in pairs, with inlet and exhaust valves on either side and mechanically operated by separate camshafts. All the valves and valve springs are interchangeable. The cylinder castings are imported from France, and great care is taken in the boring and finishing of the cylinders. The bore and stroke of these cylinders are $4\frac{1}{2}$ by 5 inches, and the motor develops its full power at 1,000 R. P. M. All gears, as well as the water pump and governor, are

completely incased. The motor is lubricated by the splash system, the oil being fed by a mechanical lubricator. An automatic float-foot carbureter having a water jacket supplies the gas to the engine. Ignition is by storage batteries and individual coils. The commutator is located just back of the rear cylinder, it being set at an angle of 60 degrees and driven by bevel gears from the camshaft. The commutator consists of a roller
(Continued on page 50.)



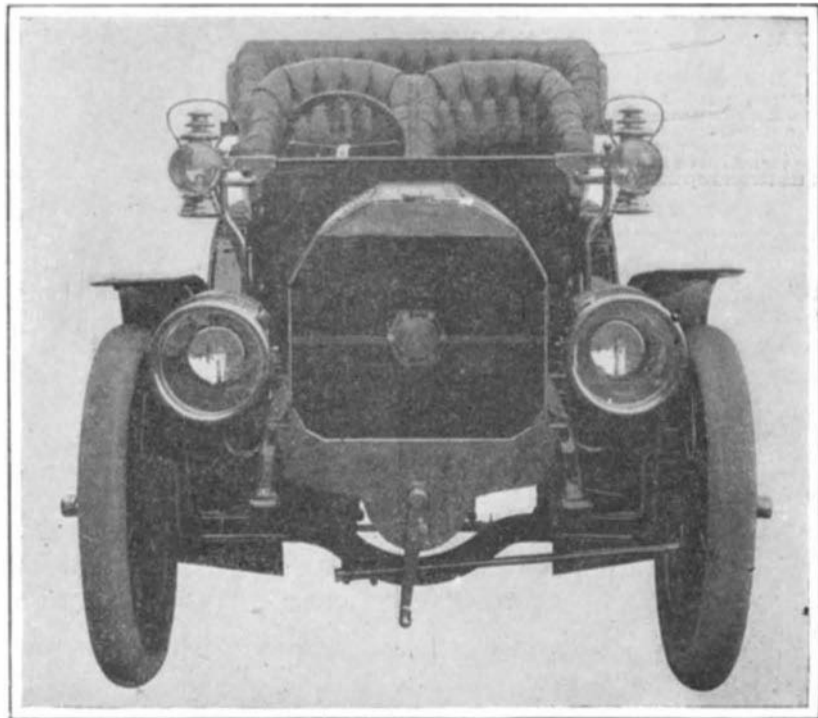
THE 1906 PEERLESS 30-35-HORSE POWER TOURING CAR HAVING SHAFT DRIVE AND 4-SPEED TRANSMISSION.

Note the complete protection of engine and transmission by means of a steel pan.



TOP VIEW OF THE WELCH $4\frac{1}{2}$ x 5, 4-CYLINDER MOTOR.

The valves set at an angle of 45 deg. in the cylinder heads and operated mechanically by rocker arms moved by a central longitudinal cam shaft, are the main features of this engine. The commutator is on the left-hand end of camshaft, the other end of which is driven by an incased bevel gear. The spark plugs are seen in the cylinder heads, the 8-feed mechanical oiler beside the upper frame, and the individual exhaust pipes and twin water pipes, as well as the belt-driven fan, are also distinctly visible. The long rod at the bottom of cut is the patent telescopic steering column.



THE 30-36-HORSE-POWER WELCH 4-CYLINDER TOURING CAR TO WHICH A LUXURIOUS LIMOUSINE TOP CAN BE ATTACHED.

Note the heavy I-beam front axle and the centrifugal water-circulating pump in the center of the radiator. The latter is a novel and distinctive feature of the Welch car.