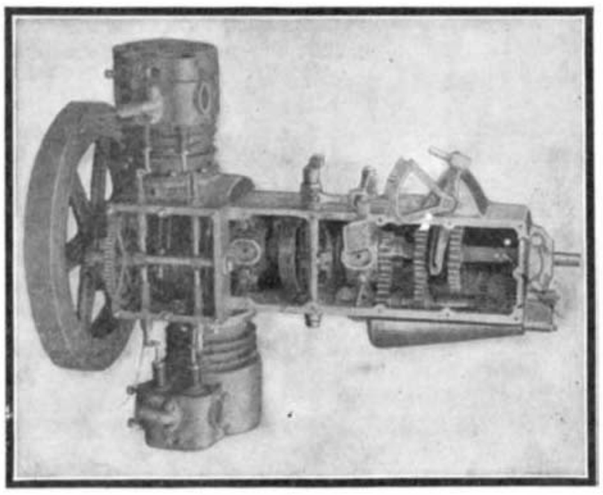
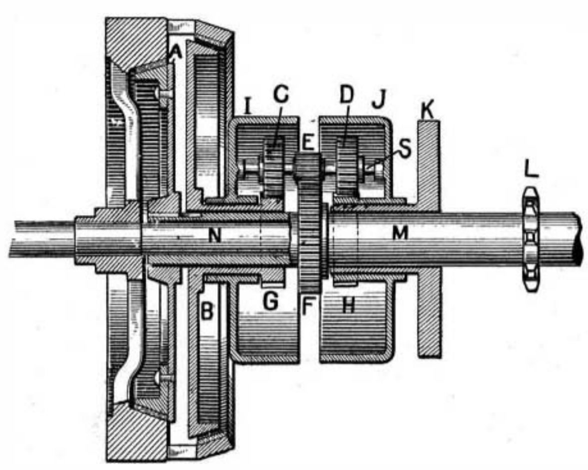
SOME LEADING AUTOMOBILES OF THE PRESENT YEAR.

The 1905 Rambler touring car is practically the same as the 1904 car of this name, which was one of the most popular on the market last year. The principal change has been in the body, which is now a side-entrance tonneau of the prevalent style, as can be seen from the photograph on our front page. The Rambler automobile is built by Thomas B. Jeffery & Co., who have one of the most complete factories in America. Practically every part of the machine is built in the immense plant at Kenosha, Wis. The engine used in this car is a 5 x 6 double opposed-cylinder motor capable of developing 18 horse-power at 1,000 R. P. M. The pistons are each fitted with six rings in pairs. The engine is mounted longitudinally on the chassis under the forward seat, and has a two-speed-and-reverse planetary gear transmission of novel construction, the gears of which do not revolve when the engine is running idle. A diagram of this transmission, which is of the usual type now employed having no internal gears, is shown herewith. Two cone clutches, *A* and *B*, are used in the flywheel. *A* locks the sprocket sleeve, *M*, to the motor and gives the direct, or high-speed, drive, while *B* contacts against a ring bolted to the flywheel. *B* has a sleeve extending to the right over *M*, and carrying on its end gear, *G*, which meshes with pinion, *C*, fastened on a revolvable stud, *S*, mounted in the two gear drums, *I J*. This stud has another pinion, *D*, near its other end. A smaller-sized pinion, *E*, between the two meshes with gear, *F*, on the sprocket sleeve, while *D* meshes with gear *H* on the sleeve of drum, *J*, which revolves on the sleeve of the brake drum, *K*, solid with the sprocket sleeve, *M*. If clutch, *B*, is let in, and drum, *I*, is held stationary by a brake band, *G* drives the pinion, *C*, in the reverse direction, and *E* drives *F* (and hence the sprocket, *L*) in the same direction as that in which the engine is rotating, but at a reduced speed. This is the low speed. The reverse is obtained by holding drum, *J*, which causes gear, *D*, when rotated as before by *G C*, to revolve with a planetary motion around gear, *H*. This planetary movement also tends to be produced by *E* acting upon *F*; but as the latter is only held from revolving by the weight of the machine, while *H* is positively held by a brake band, and as *E*, being smaller, must make more revolutions in traveling around *F* than does *D* in traveling around *H*, *F* must revolve slowly in the reverse direction in order that *E* shall make the requisite number of revolutions to circle around *F* once while its adjoining pinion, *D*, is circling once around the stationary drum gear, *H*. The consequence is that the sprocket is revolved slowly in the reverse direction. If no provision were made for unclutching the main driving gear, *G*, from the engine when the car is at rest—this gear is in all ordinary transmissions solid on the crankshaft—as soon as the band brake on *J* was released, this drum and its gear, *H*, would revolve slowly, and *F* and *L* would remain stationary. By throwing out clutch, *B*, this condition does not obtain, and the engine can be run idle without the gears turning. The transmission is heavily constructed, with large bearing surfaces for the various sleeves. The planetary pinions of bronze are six in number, there being two studs. There are also two auxiliary pinions separated by a coiled spring and so arranged as to stop backlash and chattering of the gears. The gears are packed in grease. The two speeds ahead and one reverse are had through large cone clutches in



The Maxwell 16-Horse-Power Motor and Sliding Gear Transmission with Multiple Disk Clutch.

the flywheel, upon which the wear is slight and which do not readily get out of order. The low and high speeds are obtained with a single long lever outside the body, the reverse being had by a pedal. The application of the transmission brake throws out the high-speed clutch. The car is provided with emergency



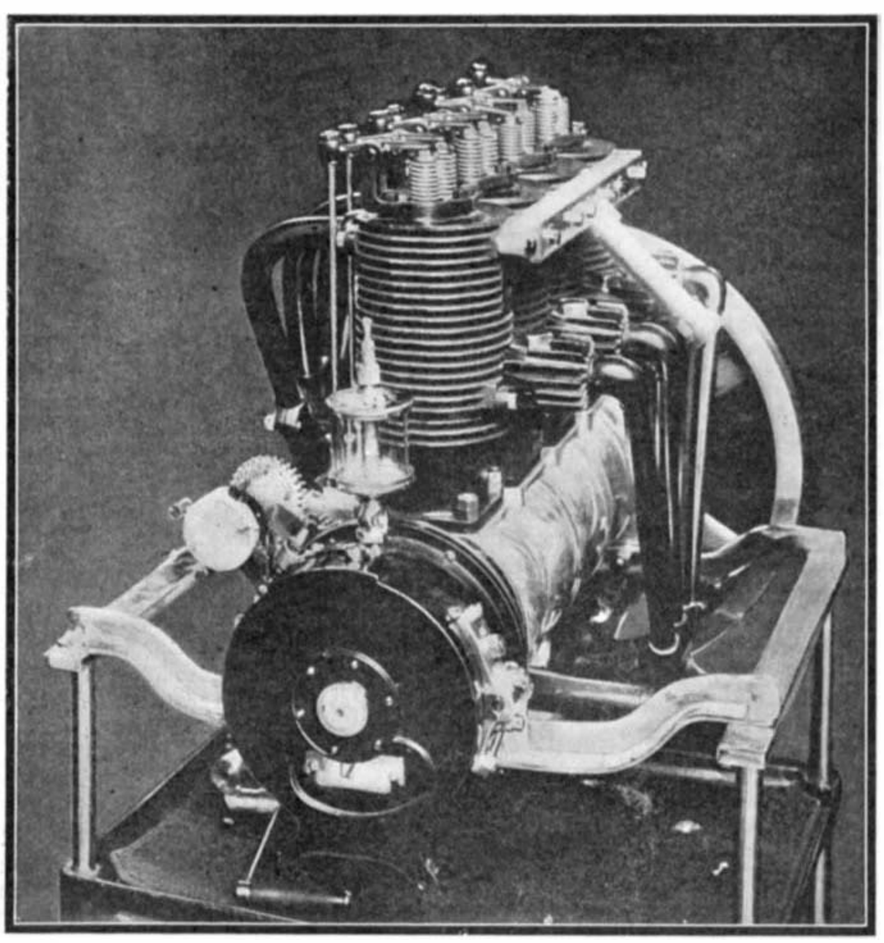
Rambler Planetary Transmission With Flywheel Clutches.

hub brakes. Roller bearings are used throughout. The steering post can be tilted forward by the driver when entering the car. The throttle is connected to a wheel immediately below the steering wheel, and is operated by grasping this wheel with the fingers and tilting it upward. The spark is timed automatically by a centrifugal governor on the two-to-one cam shaft. The frame of the Rambler is of pressed steel in the shape of the letter U. A tube across the top of the U, which is at the rear of the car, completes the frame. The fuel and water tanks are in front under the bonnet. A readily detachable wood body, finished in olive green, conceals almost entirely the mechanism of the car.

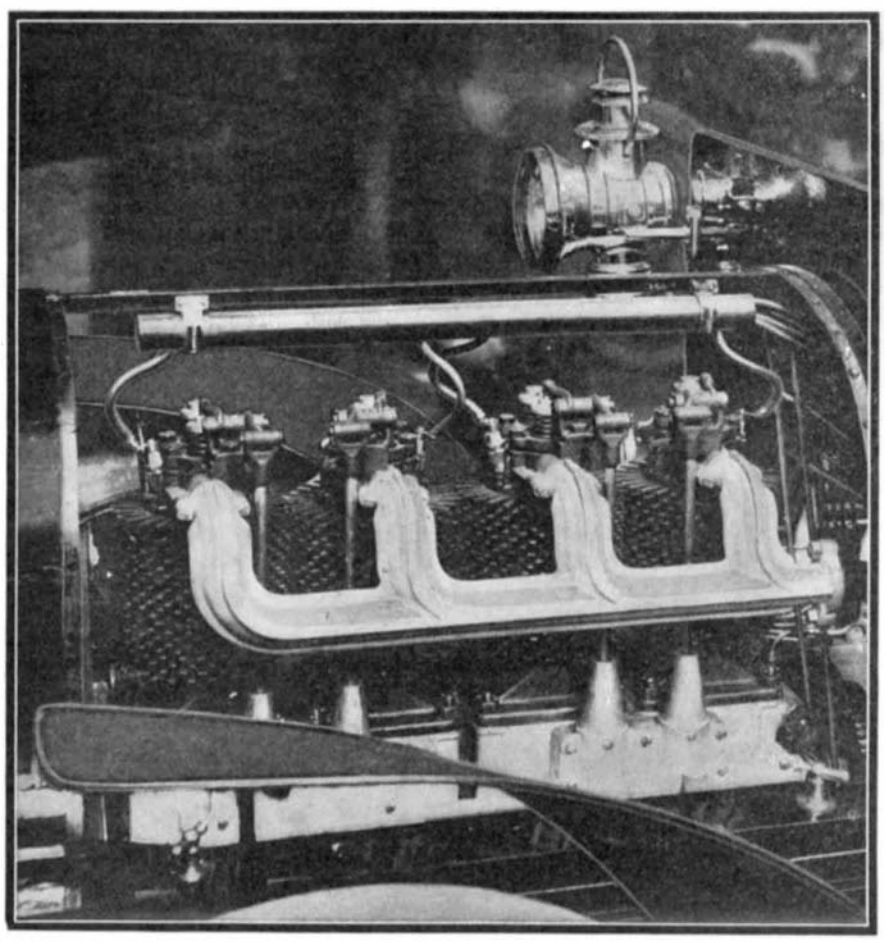
The air-cooled Franklin touring car, shown on our front page, is one of the largest and most powerful cars of this type that has ever been constructed. The engine is rated at 30 horse-power at 750 R. P. M., while at 1,000 R. P. M. it will develop nearly 10 horse-power more. Although the car has a 110-inch wheel base, it weighs complete only 2,400 pounds. It will thus be seen that it has ample power for the weight, all of which goes to make it a speedy car. The motor is a 5 x 5 flanged cylinder engine, with both exhaust and inlet valves in the heads of the cylinders, and with an auxiliary exhaust port at their base, so that when the piston uncovers this port, a great part of the exhaust gas blows out through a check valve before the piston exhausts the remainder upon its upward stroke. This special feature, together with a good-sized belt-driven fan at the front of the motor, keeps this motor sufficiently cool to operate in any ordinary temperature. All the valves and their seats may be readily removed by unscrewing two nuts on each valve cap. The engine is oiled by splash lubrication, the oil being maintained at a constant level in the crank case by a special oiler which feeds by gravity. A single automatic float-feed carbureter supplies all four cylinders with gas. The engine is connected to a three-speed sliding gear transmission fitted with roller bearings throughout and having gears of nickel steel. A universally-jointed propeller shaft extends to the rear axle, which is of the live type, mounted on roller bearings and revolved by bevel gears. The bevel gears are held in absolute alignment, and the bevel pinion shaft is supported at each end by bearings. The frame of the Franklin car is of wood, which, it is claimed, is more resilient, and transfers less of the shocks of the road to the car mechanism. The bonnet of the car can be tilted forward for examination of the motor, or it can also be quickly removed if desired. The body is of aluminium, and is finished in the very best style. It is claimed that a speed of fifty miles an hour can be maintained with this car over good roads. As the H. H. Franklin Manufacturing Company was the first to build a practical four-cylinder air-cooled touring car, so it is now the first to bring out a large and powerful car of this type capable of maintaining a high speed.

The cut on this page shows the new air-cooled motor, brought out by the Corbin Motor Vehicle Corporation, of New Britain, Conn., and originally exhibited at the Automobile Show in this city. The cylinders have grooves cut in them, and small pieces of thin sheet steel are set in and tightly peened, thus making a cylinder having a considerable radiating surface. On the larger car large fans, arranged over the cylinders, are

(*Continued on page 83.*)



12-Horse-Power Franklin Air-Cooled Motor Fitted with Auxiliary Exhaust Pipes, Which Cause a 20 Per Cent Increase in Power.



16-Horse-Power Corbin Air-Cooled Motor Having Steel Strips Set in the Cylinder Walls for the Purpose of Radiating the Heat.

IMPROVED FOUR-CYLINDER AIR-COOLED MOTORS.

SOME LEADING AUTOMOBILES OF THE PRESENT YEAR.

(Continued from page 56.)

driven by a belt from the crankshaft. The inlet valves are automatic on smaller engine, but on the larger one are mechanically operated. All the valves are arranged in the head. The motors are built in two sizes, the one shown having a 3¾-inch bore by a 4¼-inch stroke, and being geared to drive the 1,750-pound car on which it is mounted at a speed of 26 miles an hour at 1,000 R. P. M. The larger motor which is 4½ inches bore by 5½ inches stroke, will drive its 2,400-pound car 37 miles per hour at 1,000 R. P. M. The motor has all the features as regards the adjustability of bearings, etc., that are found on the large water-cooled cars.

The touring car and runabout shown at the bottom of our first page are the product of the Maxwell-Briscoe Automobile Company, of Tarrytown, N. Y. The car itself is largely the invention of Mr. J. D. Maxwell, while the radiator has been particularly designed by Mr. Benjamin Briscoe, who has had a large experience in this line of work. Both the runabout and touring car are fitted with a double opposed-cylinder motor, having the transmission arranged on the extension of the motor crankshaft in a case which forms part of the motor crank case. On the runabout, a two-speed planetary transmission is used, while the sliding gear transmission of the touring car is shown in the cut on page 56. From the transmission a longitudinal driving, or propeller, shaft runs back to the rear axle, which is driven by means of bevel gears. As can be seen from the illustration, the motor is fitted with mechanically-operated valves, integrally-cast heads and cylinders, and a large spoked flywheel. The lower part of the cylinder is cast with radiating flanges, and the cylinders are bolted to the crank case, as shown. The two-to-one cam shaft, seen running across the top of the crank case, carries on its forwardly-projecting end the cam for operating the contact device for the spark. The cam shaft is carried in a frame on top of the crank case, and which can be readily removed. The two water connections, seen on the top of each cylinder valve chamber, go to the top of the radiator, which stands in front of the motor, while the two connections in the bottom of the radiator run to the bottom of the cylinders. The special construction of the radiator, which makes it possible for the water not only to rise rapidly, but to spread in all directions at the same time, allows the inventor to dispense with a pump, which is a considerable simplification. The transmission gear is connected to the motor through a multiple disk clutch, which runs in oil, and consequently wears but very little, while always being able to free itself when the pressure is released. Sliding gears of the usual type give three speeds (with direct drive on the third) and a reverse. The rear axle runs on roller bearings. In case of breakage of the bevel pinion, this can be replaced when on the road with comparatively little trouble. The car weighs complete 1,800 pounds. It has a wheel base of 84 inches, and the 5 x 5 motor is 16 horse-power. The runabout has a 4 x 4 motor, rated at 8 horse-power. The weight of this car complete is about 800 pounds. A feature of the Maxwell car is that the bodies are all made of sheet steel, which, besides being light, is extremely strong, and takes a fine finish.

The steam machine illustrated on our front page is the 1905 product of the White Sewing Machine Company. Besides a lengthened base and more commodious tonneau, the White steamer for this year contains several improvements that add to its ease of operation. The principal of these are a sliding change-speed gear arranged in the same case with the differential, and giving a lower gear for bad roads and hills; and twin water pumps driven from an eccentric on the engine shaft. The supply furnished by one of these pumps is sent back to the tank ordinarily, and when this extra water is needed, it is readily available by opening the small valve seen projecting up at an angle in front of the steering wheel. The same size compound engine employed heretofore is mounted as usual in front, under the bonnet, but because of the new arrangements, it is good for 15 horse-power now instead of 12. The reputation of the White car both here and abroad for speed, reliability, and power, is of the highest. The combination found in it of a compound engine with a flash boiler makes it both economical and easy to operate.

One of the new light-weight touring cars of the double opposed-cylinder type to be brought out this year is the Reo car, shown on our front page. This car was designed by Mr. R. E. Olds, a gas-engine builder of great experience and the originator of the Oldsmobile runabout. While making the car as light as possible, Mr. Olds has at the same time equipped it with a powerful motor, giving 16 brake horse-power at a normal speed of about 900 revolutions per minute. The car complete weighs 1,500 pounds, so that the proportion of horse-power to weight is exceedingly advantageous. The cylinders of the Reo motor are cast integral with the valve chambers on top, thus making the valves readily accessible and placing them and the spark plug where the oil does not collect. The transmission is of the planetary type, and has several improvements, such as a ball-bearing thrust collar, and a plate friction clutch. The motor has a 4¾-inch bore by a 6-inch stroke. This long stroke is said to be especially advantageous for hill-climbing. The water is circulated by a gear-driven pump through a special form of flat-tube radiator which is not injured by freezing. The bearings of the motor are readily removable and have ample wearing surfaces. The brakes are double-acting on the rear wheels and on the driving sprocket. A heavy chain is used and the car is fitted with roller bearings on the front wheels and rear axle. All the mechanical parts are steel drop forgings, bronze bushed. No cast iron is used except in the engine. A pressed-steel frame, tubular axles, and full elliptic springs are other features of the car. While this machine is new there is every reason to believe that it will prove itself to be one of the finest light-weight touring cars for 1905.

New Uses of Electricity.

Almost every day reports of new applications of electricity come to hand. Some of these are very amusing, because they are quite improbable. Others are equally amusing, due to the fact that while the word "electricity" figures in the headline, its use in the application described is merely as a source of power, and therefore bears no particular significance. A report of the latter kind describes an electric process for milking cows, which is said to be cleaner and quicker than the present method of hand-milking. Sifted to the bottom, the electricity figures in this new and wonderful process only as a means of driving a pump; and, while we are not ready to admit that any other power could be applied quite as well here, we can not deny that a four-footed dog could do the work approximately as well as a three-phase motor.

Another report describes what was, in effect, an electric boot-jack. A young man thoughtlessly rested his foot on a wire fence during a thunderstorm. Lightning struck the fence and removed the shoe from his foot. From the report it does not appear that he was much damaged, but the condition of the shoe after the accident is not mentioned. While this is an adaptation of electricity which few would care for, it can not be denied that the lightning did its work, and did it quickly. To suggest the regular use of lightning in this way would be absurd, but it would be no more absurd than are some of the other suggestions which are put forward and received without question.—Electrical Review (N. Y.)