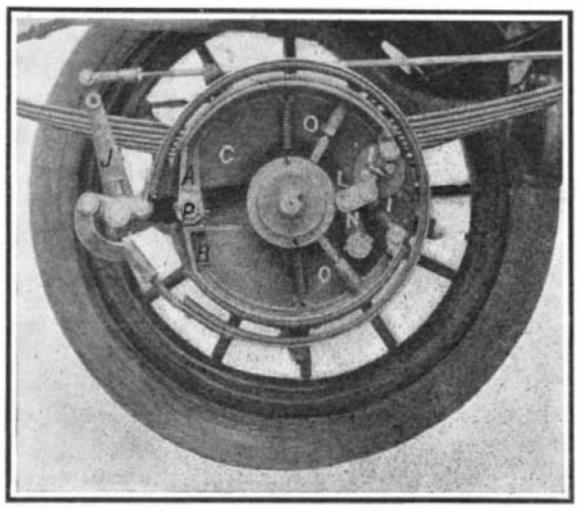
TYPICAL BRAKES ON 1907 CARS.

The accompanying photograph shows the double brakes used on the rear wheels of the new Cadillac touring car, which are typical of those used on many other 1907 models. As can be readily seen, there are both an internal expanding and an external contracting brake, each of which is lined with camel's



TYPICAL EXTERNAL AND INTERNAL HUB BRAKES USED ON CADILLAC CAR.

A, *B*. Expanding shoes lined with camel's hair felt. *C*. Supporting drum on end of stationary axle sleeve. *I*, *I*. Toggles for expanding shoes. *A*, *B*. *N*, *L*. Lever and links connecting with toggles. *O*, *O* Adjustable stop for limiting withdrawal of shoes by coiled springs. *J*. Lever for operating contracting band brake.

hair felt, a material which has had much vogue of late for this purpose. The internal brake is made up of two semi-circular shoes, *A* and *B*, supported upon a pivot pin, *P*, that projects from the steel casting, *C*, forming one end of the rear axle tubing. These shoes are drawn together and away from the brake drum of the wheel by means of two coiled springs. The distance to which they are withdrawn is regulated by two pins with lock nuts, *O O*, which screw into sockets in the shoes and press against a central washer surrounding the axle. The lever arm, *N*, which operates the brake, is connected to the toggles, *I I*, by a link, *L*. When the shaft carrying this lever arm is rotated, the toggles are pressed apart and the shoes are expanded. This makes a very powerful emergency brake, and is operated by a hand lever. The outer contracting band is operated by a lever, *J*, which, when it is moved forward by the rod shown, pulls the two ends of the band together by means of the rocker attached to its shaft. This brake is connected to the pedal, and is the regular running brake. Both brakes are equalized, so that an equal pressure is exerted upon the drums of each wheel.

AN IMPROVED SLIDING-GEAR TRANSMISSION

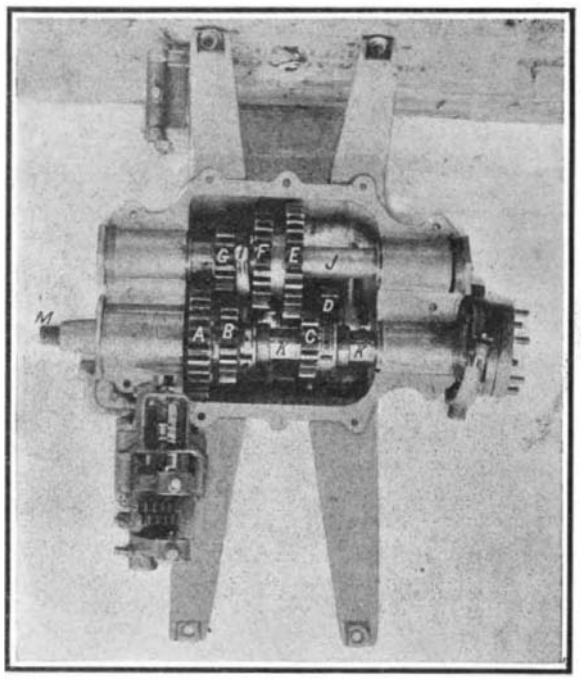
The transmission used on the new 20-horse-power 4-cylinder Cadillac car is of the double sliding type, in which the gears on both the main and secondary shafts are made to slide. In the photograph the gears are on high speed, *A* and *B*, which are on the shafts *M* and *K* respectively (the latter shaft telescoping into the former within the gear *A*), being locked together by the usual type of jaw clutch. The two gears, *E* and *F*, are securely fastened to the shaft, *J*, while the gear, *G*, is made to slide upon it. To obtain the first and second speeds, gear, *G*, is slid to the left upon the squared portion of shaft, *J*, and gear, *C*, is brought into mesh with *E*, or gear, *B*, with *F*. As soon as the gears are moved to the high speed, *G* is automatically slipped out of mesh with *A*, and moved into the position shown.

In this position no gears on the secondary shaft, *J*, are running. To obtain the reverse, pinion, *C*, is brought into mesh with *D*, which carries upon its shaft another gear that meshes with *E*. This reverses the motion of the gears on the lay shaft, and also that of the driving shaft, *M*. The gears are shifted by means of a lever which operates through toothed sectors, to slide the gears by means of connections to the shifting forks. These connections are not shown in the photograph. Both shafts of the transmission are mounted upon Hyatt roller bearings. The design of this transmission is such as to facilitate the meshing of the gears without the usual crashing and grinding which takes place with many sliding gear transmissions. The gears are inclosed in a strong aluminium casing provided with an oil-tight cover, and having arms by which it is attached to the frame of the car.

THE DRAGON CHASSIS.

The accompanying illustration shows a plan view of the chassis of the Dragon light touring car. This is a new machine that has recently been placed on the market, and while the manufacturers do not claim anything radically new in its construction, they do believe that the car has incorporated in it many of the well-tried and proven features used on present-day automobiles. When the car is loaded to its full capacity, it is said to develop at the rear wheels a horse-power for every 100 pounds of weight. The engine is of 26 horse-power. It has inlet and exhaust valves on opposite sides of the cylinders, all mechanically-operated. A mechanical lubricator is placed beside the engine and driven by a belt. The reason for the use of valves on opposite sides of the cylinders is given as greater working efficiency, because the cooling water can be admitted around the exhaust valve (which is the hottest point) and taken out from around the inlet

CHASSIS OF THE DRAGON 26-HORSE-POWER TOURING CAR, SHOWING DRIVING SHAFT INCASED IN TORSION TUBE AND RADIUS RODS BRACING THE LATTER.



NEW ROLLER-BEARING TRANSMISSION OF CADILLAC LIGHT TOURING CAR.

valve, which it keeps at a uniform temperature and thus aids carburetion. The engine is fitted with a reverse cone clutch in the flywheel. The clutch ring can be removed very easily, thus allowing the leather face of the cone to be inspected and cleaned. If necessary, the leather can be readily renewed also. The particular feature of interest about this car is the arrangement of the torque tube and radius rods. There is but one universal joint in the propeller shaft, and this is immediately back of the transmission. The torque tube ends in a pair of U-shaped arms, which are pivoted upon a sliding yoke. The radius rods run from the rear axle to the torque tube near its upper end, where they are attached to a yoke that is slidably mounted upon the torque tube. Thus, the rear axle, torque tube, and radius rods are virtually one solid unit, which can assume any ordinary angle with respect to the frame of the car.

The transmission is of the usual three-speed progressive type. Both it and the engine are mounted on a sub-frame extending from the front to the middle of the chassis.

THE WAYNE TRANSMISSION AND CLUTCH.

On the Wayne 1907 touring car is seen another design of combined transmission and differential located on the rear axle. In designing its new car this way the Wayne company has but followed out the lines

PLAN VIEW OF REAR OF WAYNE CHASSIS, SHOWING TRANSMISSION COMBINED WITH DIFFERENTIAL ON THE REAR AXLE.

F. Torsion rod. *Q*. H-shaped quadrant for selective-type transmission. *R*, *R'*. Connecting rods for operating shifting gear sets in transmission. The photograph shows one end of pin, *P*, in engagement with fork, *V'*, the downwardly-projecting lever of which is connected with *R'*. Lever, *G*, is on sleeve, *S*, which carries lever with pin, *P*. *X*. Propeller or universally-jointed driving shaft. *Z*. Rear universal joint of *X*.

REAR OF DASH, SHOWING SPARK COIL, TIMER, CLUTCH, AND CONTROL MECHANISM OF WAYNE 30-HORSE-POWER CAR.

A, *B*. Brake pedal and connecting rod. *C*. Clutch pedal. *D*, *E*. Emergency brake lever and connecting rod. *F*. Expanding leather-lined clutch. *G*. Gear-shift lever. *I*, *I*. Clutch-shifting levers. *J*, *K*. Clutch collar and shipper. *M*, *N*. Lever arms that throw out clutch when emergency brake is applied. *P*. Pin on lever of sleeve, *S*, which engages forks *V*, *V'*. *R*, *R'*. Connections to shfting-gear sets from *V*, *V'*.