A TYPICAL AMERICAN FOUR-CYLINDER GASOLINE TOURING CAR MOTOR.

(*Continued from page 57.*)

the coils being visible. This engine has 4½ x 5-inch cylinders, and, at a speed of 900 R. P. M., develops 30 horse-power. Both it and the transmission of the Buffum car are protected by a steel pan beneath. The finish of all the parts of the car is excellent, and the wheels, rear axle, and transmission are all mounted on imported, non-adjustable, ball bearings. The Buffum motor is one of the few American motors having both systems of ignition.

AN AMERICAN MOTOR SLEIGH.

One of the novelties at the recent Automobile Show was a motor sleigh invented by a Boston lawyer, and which has, we are informed, been thoroughly tested and driven at a speed of 15 miles an hour for four hours at a time. As can be seen from the illustrations on page 57, the sleigh body is mounted upon a suitable framework, carrying at the forward end a high-speed, air-cooled, gasoline motor. The first speed reduction is obtained through a large gear meshing with a pinion on the motor. A sprocket on the same shaft as this gear drives a three-throw crankshaft in the middle of the frame by means of a chain running over the large sprocket, *I*, thus reducing the speed still further. The cranks are connected through horizontal connecting rods, *R*, with three pushers, *P*, having at their lower ends spikes and knife blades for cutting into the ice and snow. These pusher rods are hung from slotted arms, which are suitably connected to peculiar-shaped cam disks, *K*, which cause them to rise into the position in which the right-hand pusher is seen in the rear view of the chassis during the return stroke. The pusher rods are provided with springs, which keep them fully extended, yet allow them to be raised in the slots of the arms just mentioned, should they meet with an obstacle in the road. A suitable friction clutch connects the motor to the countershaft when the machine is being driven. The sleigh is provided with two flat grooved plates pivoted on the ends of rods and shown at *BB* in the rear view of the chassis. These plates act as brakes when moved down against the ground. The sleigh is steered by moving the front runners in the same manner as the front wheels are moved on an automobile. The frame of the sleigh is supported on springs on the runners. The principle used for propelling this sleigh is much the same as that used on some of the original locomotives. The inventor claims that it is the correct one, as the pushers pack the snow and obtain a positive hold when traveling in soft snow or on ice. The use of toothed wheels for propelling a motor sleigh, it is claimed, has never been entirely successful. The motor used on the present model is of 4 horse-power. The stroke of the pushers is 16 inches, so that they move the sleigh forward 4 feet for every revolution of the three-throw crankshaft.

Greensand is a closely coherent clayey or sandy deposit, composed largely of the mineral glauconite—a hydrated silicate of iron and potassium. Owing to the presence of the latter element it is often employed as a fertilizer.

For many years Algiers has been one of the principal ports in the Mediterranean as a coaling station. The coaling trade at Algiers has steadily increased from the year 1885 to 1900, during which period it successively rose from 5,000 tons in 1890 to 244,000 tons in 1895, and to 290,000 tons in 1900. During the same time the coal trade at Gibraltar, which had risen to 562,000 tons in 1889, gradually decreased to 272,000 tons in 1895, to rise to 303,000 tons in 1900. Algiers supplied in 1902 for ships' bunkers 297,000 tons, and in 1903 she supplied 339,000 tons, whereas the amount supplied by Gibraltar fell to 167,000 tons, and finally to 123,000 tons.