AUTOMOBILES

CUTTING OUT THE RATTLE

Makers Diligently Striving for Noiseless Driving Gear.

WHERE THE TROUBLE COMES IN

Problem Simmers Down to One of Accuracy in Cutting and Finishing Teeth — American Superiority.

Noise from gears is one of the most important things to consider in the making of a quiet-running automobile. A transmission can now be made of hard alloy steel with practically noiseless spur gears so far as vibration is concerned. Experience in electric machines long ago indicated that an unhardened gear of the herring-bone type could be made positively noiseless. Of course, a sliding herring-bone gear cannot be made.

One theory of noise in gears is that of irregular tooth pressure; when, from slight inaccuracy, one tooth has a pressure different from that of the next succeeding tooth, thereby setting up a varying vibration and backlash. If the speed of the gears is rapid, a complicated vibration, amounting to a noise, is set up.

The shape of the transmission (change speed gear) case has a material effect on its quiet running qualities. In one method of cutting gears the teeth are planed, not cutting too much; making every effort to get the gears accurate. In another method the cutting is done by a rotary cutter; accuracy being obtained by making a large diagram of the shape of the cutter accurately to suit the number of teeth and pitch in each particular gear. This makes a more difficult job to get an accurately generated tooth-shape and great accuracy between each tooth, than with the planing process above mentioned.

Difficult to Overcome.

It is difficult to overcome the distortion of a gear in hardening. In the case of camshaft gears there is an action different from that of any of the other gears in the car; an intermittent action. There is a diversity of opinion as to the proper size, width of face, pitch and material of camshaft gears, to best solve the problem of this particular condition.

Bevel gears, it is pretty generally conceded, run more quietly than spur gears. One reason given is that they have a chance to spring away from the tooth pressure, whereas the spur gears have not unless their shafts and bearings also spring away.

A high grade gear, which may reasonably be expected to stand up to its work for tens of thousands of miles, must be properly designed, of the proper material, subjected to repeated approved heat and mechanical treatments and be accurate not only as to tooth-form, but have a hole of true and proper size, its keyways, or corresponding members, of proper dimensions and accurately located; its blank having been turned true and of exactly proper diameter. To obtain quiet-running the form of the tooth must be laid out properly, selecting from the different forms advocated by various engineers; every step in its manufacture and mounting made carefully and with precision.

There is a difference of opinion as to whether relatively large or small gear teeth run more quietly; that is, teeth of large or small pitch. One argument in favor of the fine teeth as against the coarse, is that they have a greater number of teeth, or points of contact, in mesh at one time, which distributes the load and prevents clatter.

Primary Cause.

Noise is due primarily to inaccuracy of toothform, but can also be caused by putting a pair of gears in mesh too closely. With a "hunting tooth" arrangement; that is, with an odd tooth in one gear (the number of teeth in one gear not being a multiple of the number of teeth in its mate) the gears may wear to a state of comparative noiselessness after a while. However, good gears will not show material wear in a reasonable length of time. Running in emery and oil for a time in assembly or test will reduce noisiness somewhat, but unless the teeth are properly and accurately formed in the first instance this will seldom obviate the trouble entirely. Assuming that the gears are set with a proper amount of clearance between them, running in emery will help very little.

The question of noise in gears comes down to a question of accuracy, not only in cutting and finishing, but in mounting them in their respective places. The shafts on which they are to run must be parallel and be in the same plane.

Five to seven thousandths of an inch clearance is about the correct amount for spur gears. With fixed shafts a greater amount would be of no advantage. In automobile work it is unnecessary to make the gears run without any backlash, except in the case of valve gears, by which the valve and ignition apparatus must be actuated exactly in time. In some cases the clearance of various gears on an automobile is as much as ten or twelve thousandths of an inch. It is in matters like this, which, as a matter of fact, is one of the most complex subjects in automobile engineering, that long experience in automobile manufacture gives the pioneer American makers a marked advantage in their endeavor and repeated success in producing machines, judged on any basis, at least the equal of any made abroad.—Recreation.

Standard Auto Co.'s List of 1910's.

Less than two months ago this company began business in Omaha, handling the great St. Louis car, the Standard Six—the National, which Mers has so often driven to victory, and the Traveler, a new but popular, medium priced car. In speaking of his list, Mr. Wilcox, president of the company, said: "We have, I am sure, the best line in the market. Not better only than those priced as they are, but better when it comes to workmanship and material than any car made. We wish purchasers to compare our cars side by side with any cars, regardless of price. They have no small motors that require you to shift gears three or four times to climb a little hill. We have just as good material in our $1,250 car as is put into any car.

The Standard Six is the car complete. It has everything necessary. It is powerful, perfect, silent. Wheel bore, 124 inches, choice of tires. The National is beyond comparison, while in the Traveler the manufacturers have overcome the greatest difficulty in car manufacturing—that of putting in a motor of sufficient power to carry the car anywhere over any road.

The Home of the Stearns.

The Wallace Automobile company, Twenty-fourth, near Farnam, has just made arrangements to handle the Stearns and will have one of the cars this week.

The Stearns is a high class car. It takes its place with the best ones of the country. The Stearns people have endeavored to build the best car possible, regardless of cost. They propose to makes the best all of the time, and do not expect to make a new car every season and call it a new model. They have no special 1910 model—it is just the Stearns car—made all of the time as good as skilled men can make it. They believe that if they build a good car this year that it will be good enough to offer next season, with such little improvements as come up from time to time. They do not believe in radical changes. They only change those parts of a car from one season to another that actual experience teaches should be changed.

Wallace is a practical mechanic with a good many years of actual shop practice and can demonstrate to buyers that the Stearns is a car without a peer.