

DIRT CAUSES MOST TROUBLE

Expert Tells How Engine Parts Are Tested

Crystallization and breakage, formerly given as the cause for the failure of a part of a motor car after a long period of service, has become one of the exploded theories of the past. Studies which have destroyed the old "crystallization" theory have also pointed the way to even greater dependability in highly stressed parts of the present day car, according to L. A. Danse, metallurgist of the Cadillac Motor Car company.

Mr. Danse explains that in advanced engineering circles the mysterious something commonly called crystallization and breakage has been analyzed just as medical men analyze a disease and isolate its germs and that it is in reality "fatigue" breakage, due to impurity in the metal or some other definite defect which can now be exposed by known laboratory and physical tests.

"As metals are naturally crystalline in structure," states Mr. Danse, "it is evident that breakage in service is not due to crystallization. The metal is a crystalline mass from the time it is first melted and poured. When it solidifies after melting and pouring, it assumes the crystalline character; the same as water solidifies to snow, frost or ice crystals.

Just Plain Dirt

"Researches in metallurgy show that where a motor car part fails in service, the principal cause is not mysterious at all. It is usually just plain dirt. It is impurity so microscopically fine that without the most conscientious examination it defies detection.

"The method of determining the cleanliness of a metal is really very simple. It is merely a process of taking infinite pains—accuracy of examination and analysis to a degree formerly unknown even in the best of laboratories.

"Here at Cadillac every lot of metal intended for use in highly stressed parts for the car must undergo the most thorough microscopical examination.

"The sample to be examined is first polished to a degree of smoothness seldom seen in commercial products. Smoothness in highly polished plate glass or in a piece of silverware is crude compared to the smoothness required in the testing laboratory.

Spoon Illustration

"Take a silver spoon, for example. If you are invited out to dinner tonight and have been lucky in your invitation, maybe there will be a real silver spoon at your place, newly polished by the best Good Housekeeping methods. To your eye it looks perfectly smooth. As it passes your lips they also record perfect smoothness. That surface under a powerful microscope would have ruts and furrows; and a plated spoon in a quick lunch room, under this same microscope, would plainly show mountains and valleys.

"When we prepare this sample for examination, we must make it even microscopically smooth. Five hours is spent in polishing a half-inch square of surface.

"This surface is then examined under a glass magnifying to 100 diameters—a task for a busy 20 minutes. One might examine it in 15 minutes, but he would have to slyt some areas of the surface which might contain dirt inclusions."

The metallurgist was interrupted by an exclamation, and continued with a smile, "Yes, you can glance at a nickel in an instant and know that it is a five-cent piece, but if you really want to see it and know how pure

that nickel is, it will take you 20 minutes to explore its whole surface—and at that will need to hustle.

"After a thorough visual microscopic examination the metal is photographed with a camera which magnifies from 100 to 2000 diameters and suspected areas are more closely studied.

Watch for Impurities

"The structure must be fine in order to have the strength which the work to be done by the part requires; so we must watch for impurities which would lessen that strength.

"Sometimes we have to follow a piece of metal all the way back to the steel mill, where it was first poured into ingots, and suggest changes in methods there in order to bring it up to the required standard.

"This original inspection is just a beginning. That lot of metal is followed all through the manufacturing process. At every stage samples are brought to the laboratory and re-examined. Every day connecting rods, for instance, are taken from stock, cut open and examined just as a check

upon the cleanliness and strength of the metal being used.

"A single defective part in a steering mechanism, we remember, might cost some future time cost a human life, and every possibility of such a part entering a Cadillac car must be absolutely eliminated before that part is assembled in the finished chassis."

IF YOU USE BALLOONS JUST GLANCE AT THIS

The motorist who changes his tires over to balloons or any other low pressure tire should equip with the new Gabriel balloon-type Snubbers to conform. points out Arch B. Van Deusen of Motors Service, Inc., local Gabriel distributor.

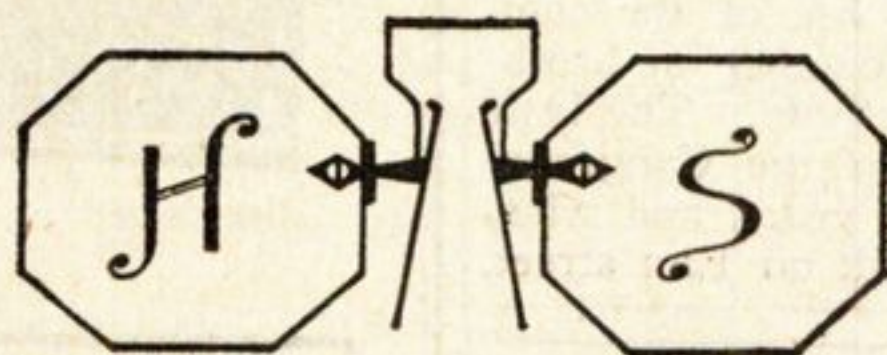
"Car owners changing over to low pressure tires should come in to see us regarding the proper snubber if they desire actually to achieve the easier riding results they seek," he said yesterday. "The new Gabriel

balloon-type Snubbers are designed to give the necessary free play that enables low pressure tires to absorb the small bumps on apparently smooth roads. At the same time, they have the increased braking action needed to control the springs and tire action when larger bumps are encountered. "These new Gabriel Snubbers make a world of difference in the riding comfort of cars equipped with low pressure tires. They are especially designed for balloon tires, just as the standard Gabriel Snubber is designed for standard tires."

In June, electric light is used in the average residence only one hour and a half a day, while in December it is used about six hours and fifty minutes per day.

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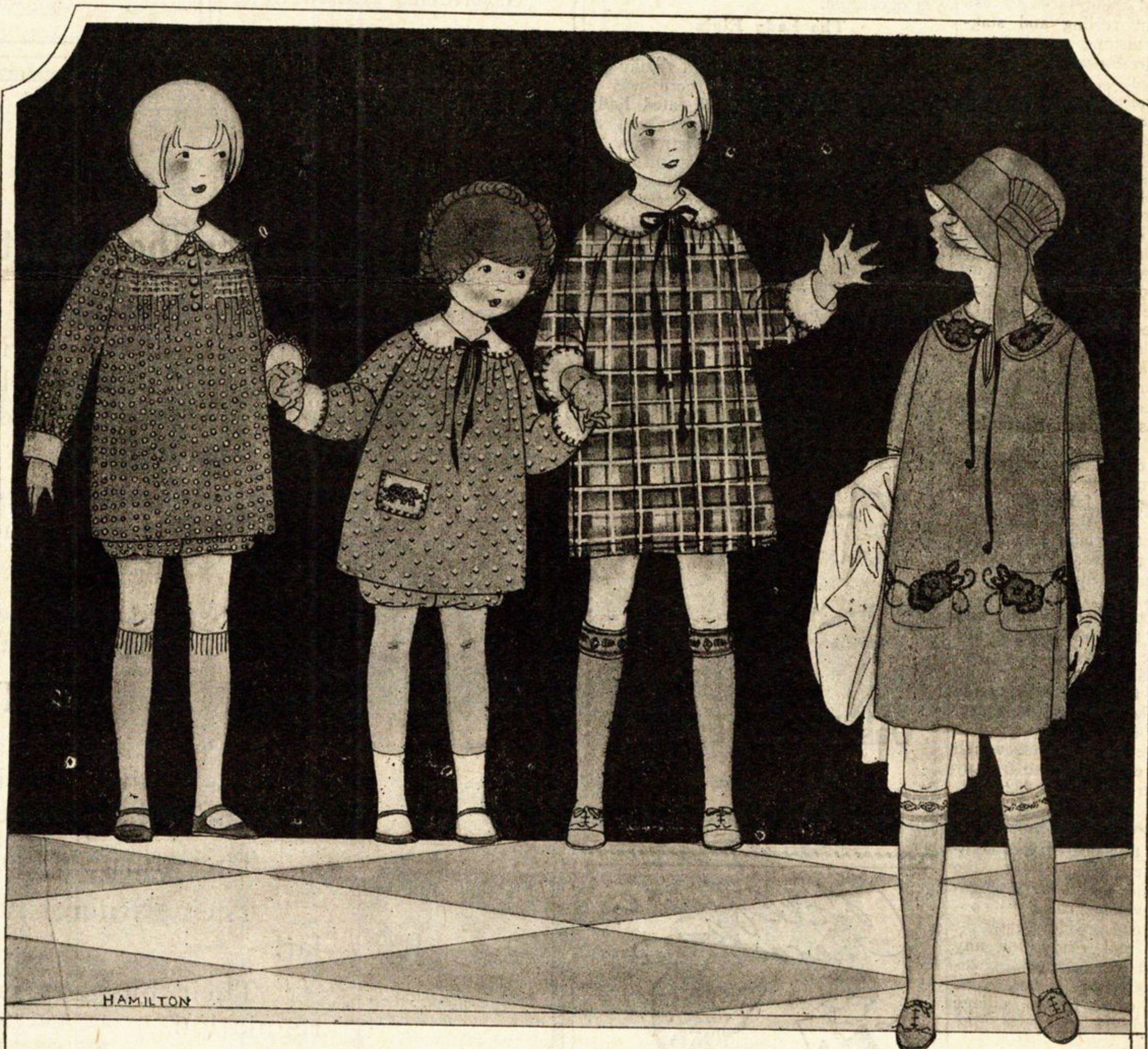
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