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GM

GENERAL MOTORS

Hall *of* Progress

A CENTURY OF PROGRESS EXPOSITION

1934

IN 1908, General Motors was organized. Today, a little over 25 years later, it stands as the world's largest producer of automobiles.

There is a reason for this. The management of General Motors has always dedicated its products to Progress—it has constantly endeavored to present to the people, each year, improved automobiles.

Here, at the Century of Progress, in 1934, it has established a Hall of Progress to recall to all of those people who are familiar with such names as Cadillac, La Salle, Buick, Oldsmobile, Pontiac and Chevrolet that General Motors has done its part towards the advancement of transportation.

Twenty-five years—nineteen major contributions. From the self-starter, which made it possible for millions of women to drive automobiles, to the latest Knee-Action suspension system, which turns bumps into boulevards, General Motors has consistently pointed the way. Is there a car built today that is not equipped with a self-starter, does not have a lacquer finish and the engine of which is not mounted in rubber?

So, in the spirit of the Century of Progress, General Motors dedicates its quarter of a century of progress to the motorists of the world with the pledge that it will in the future, as in the past, provide the best motor transportation for every purse and purpose.

IN THIS Hall of Progress are shown eight of the outstanding advances in motor transportation in which General Motors has led the way. There are several other improvements in which the Corporation, through its Research Laboratories and divisional Engineering Staffs, has pioneered. A large number of contributions—almost one each year.

To mention some of the outstanding contributions not shown here, we find the V-type fan belts, harmonic balancer, chromium plating, engine driven fuel pump, and improved muffler and carburetor intake silencer. In addition might be mentioned perfection of quantity production methods for four-wheel brakes and crankshaft balancing. All of these improvements with one purpose in mind—to give the automobile purchaser the best in motor transportation development in products of proved value.

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Through its Customer Research Staff, General Motors senses the wishes and desires of car purchasers based on their experience with their present cars and tries to satisfy the wishes with thoroughly tested new products.

Through the efforts of its engineering staffs, the Corporation is continually searching for new uses of old, well tried ideas, and applications of new ideas—with an eye to the future. At the same time it senses the demands of the buying public—an ear to the ground. Thus General Motors points the way.

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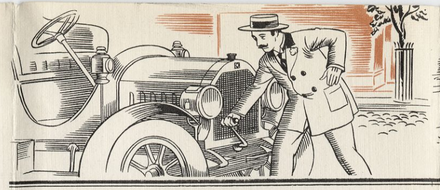


PROGRESS *and* STARTING

The early automobiles, like the first gasoline engines, were started with cranks. Bruised muscles and broken bones often resulted from backfiring of engines when starting. Only strong men could start such cars with any degree of safeness.

Electricity was put to work to perform this unpleasant task so that heavy engines might be started with only a light touch of the foot to a pedal or by closing a switch on the dash. With this electric starter a woman or child can start a modern high-powered car as easily as the strongest man.

The first self-starter was used on the Cadillac in 1911. It was heavy, noisy, difficult to use, and costly to install and keep in operation. Research and progress in manufacturing methods have given us the modern starter which is simpler to operate, quiet in doing its work, and at a cost which gives it universal use on all forms of motor transportation equipment. With the starter as with other automotive improvements, General Motors has pioneered in progress to give a dependable product within the reach of all automobile drivers.

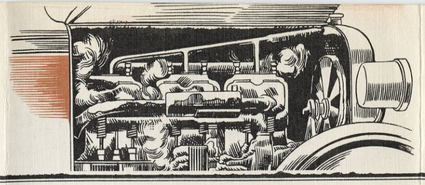
PROGRESS *and* FINISHES

The appearance of a car is determined by the form of its body and the quality of its finish. Since the car is used in all kinds of weather conditions, the finish is subjected to extreme changes and must be durable.

Manufacturers of early automobiles used the same paints and varnishes as in carriage production. The time of application of this finish was long and its durability was poor.

Lacquer finishes which could be sprayed on the body and dried in a short time were developed by the du Pont Company and General Motors. This shortened the production time from many days to a few hours and gave a finish which would withstand the most severe of weather changes.

General Motors pioneered in this field of car appearance by first using Duco finish in 1923. Since that time this type of finish has been almost universally adopted for automobile bodies as well as for furniture and household devices. Progress has given us a selection of colors for every taste—another proof of General Motors desire to pioneer in every phase of progress.

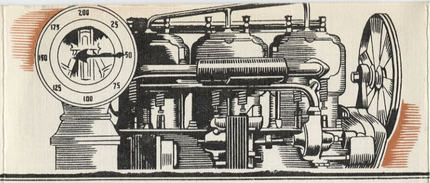


PROGRESS *and* DURABILITY

Failure of some of the vital parts of the automobile engine was quite common a decade ago even in nearly new cars. Study of these failures showed that they were due to corrosion of the parts from contact with acids in the crankcase. Small amounts of water condensed in the crankcase when the car was started in cold weather. Burning of the gasoline containing sulphur formed products of combustion of which small amounts passed by the piston rings into the crankcase. When these products dissolved in the water there, acids were formed, and if allowed to remain in contact with metal parts corrosion resulted.

Crankcase ventilation makes use of drafts of air to remove these acid fumes before they have time to collect on the metal parts and produce harmful effects. This development also frees the engine of burned oil fumes and thus makes its operation clean.

The developments that General Motors has produced in this field added to others have given to the automobile purchaser greater dependability as well as more satisfactory operation.



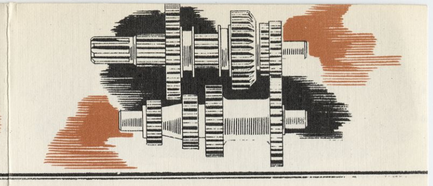
PROGRESS *and* FUELS

General Motors has always considered the fuels and lubricants as much a part of the automobile engine as the pistons and spark plugs. For this reason research engineers have been trying for the past twenty years to find out just what happens in an engine when the fuel burns.

In making this study, it was found possible to eliminate the undesirable noise which we call "knock" by the addition of small amounts of tetraethyl lead to ordinary gasoline. This material is now used in more than eighty per cent of the gasolines consumed.

This development has made possible the use of engines of higher compression, which give greater horsepower for the same size and weight of its parts. It allows the engine to run cooler and more efficiently as well as removing completely the undesirable "knock".

General Motors continues to study the problem of burning fuel in an engine and will give to the user of the automobile better designed engines to make the most of improvements in fuels—more and better miles per gallon.

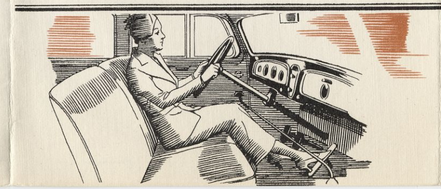


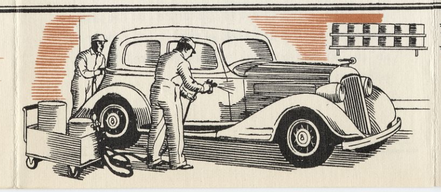
PROGRESS *and* NOISE

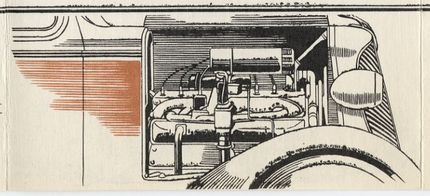
Clashing, grinding noises accompanied the shifting of gears in the automobile of 1920. These noises not only made the passengers uncomfortable, but showed that the gears were being subjected to unnecessary strains.

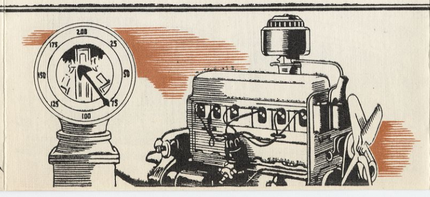
To give added comfort to the motorist and to give quieter operation, General Motors pioneered the development of the Syncro-Mesh transmission. The old types of gears were replaced by those of quieter operation. The Syncro Mesh is simply a mechanical device installed in the regular type of transmission to insure that gears are brought automatically to the same speed before they are engaged, thus making it unnecessary for the driver to learn special tricks to obtain a quiet shift.

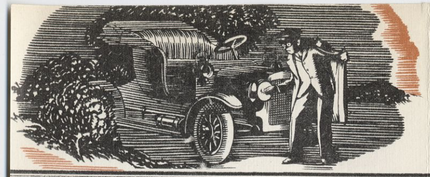
Noisy shifting and undue transmission gear wear have been almost entirely eliminated from all modern cars because of General Motors pioneering efforts in the field of noise elimination, in the development of silent gears and the application of Syncro Mesh transmissions











PROGRESS *and* LIGHTING

Early acetylene headlights were replaced by electric bulbs to give more dependable lights which could be easily controlled. With the development of sturdier storage batteries, electric lights were more widely used on automobiles.

Great discomfort and even accidents were the result of poorly directed light beams from these first electric headlights. To remove these undesirable qualities, General Motors studied the problem of road illumination and produced the multi-beam system of headlights now almost universally used.

The modern headlamp gives a light beam which illuminates the road without producing as much uncomfortable glare in the approaching driver's eyes as the old lights. This beam may be directed by the operation of a switch to give a beam of light on the road where the driver most desires it.

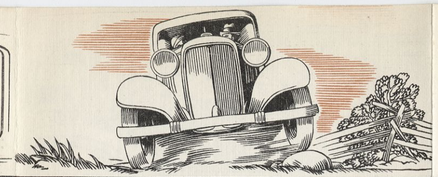
Increased safety and added comfort to the motorist have been given by this progress in headlights in which General Motors has pioneered.

PROGRESS *and* COMFORT

The early open types of automobile bodies were soon replaced by closed cars to add to the comfort and convenience of the motorist in bad weather. Ventilation of closed bodies without uncomfortable drafts was a problem which had to be solved.

General Motors has developed "No Draft" controlled ventilation to be used on all closed bodies. Through the use of this achievement, it is possible to obtain fresh air in the car without drafts on the passengers. Smoke and fouled air are removed by the air currents along the side of the car. It is now possible to obtain fresh air in the car even while driving in rain or snow storms without being drenched with rain or covered with snow.

Comfort and convenience to all passengers has been the result of the application of controlled ventilation to the motor car body. This convenience, along with the lines of beauty of the Fisher body, are another General Motors achievement in progress.

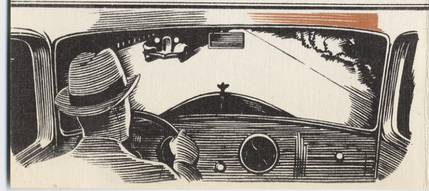


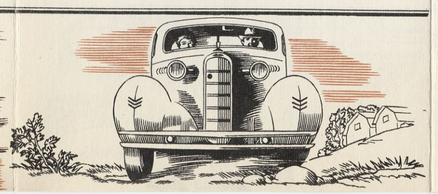
PROGRESS *and* RIDING

The front springs used on automobiles before 1934 served two purposes, to produce comfort in riding and to hold the front wheels in position. Leaf types of front springs were carried over from the old carriage type of construction and had to be made stiffer than the rear springs to withstand the shocks encountered in holding the front wheels in place.

By independently connecting each front wheel to the frame the springs only have to serve one purpose—give riding comfort. Thus, the front springs are made as soft as the rear springs to give a smooth, level ride and the independent mountings hold the front wheels to the frame with a stronger mechanism and in better alignment than ever before. This is not an experiment, but a well-tried General Motors development to give the best in riding comfort to the motorist.

The use of independent "Knee-Action" suspension is the latest of General Motors contributions to progress, and its application to the motor car has removed one of the last marks of the carriage in automobile construction.





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