

13

FORD

AT THE

FAIR

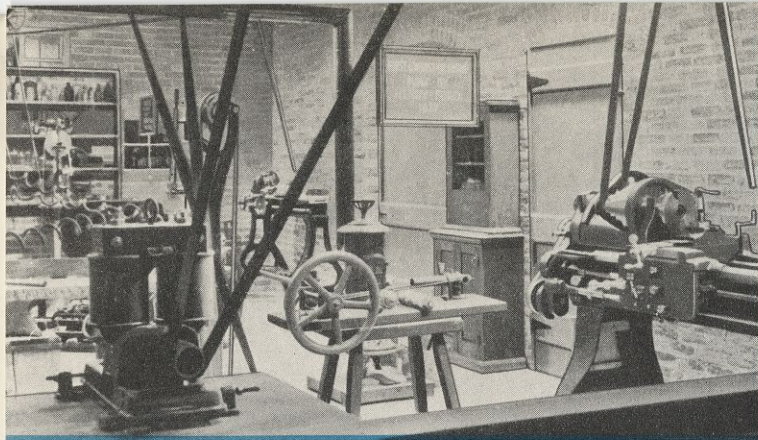




THIS booklet is presented by the Ford Motor Company as a souvenir of your visit to the Exposition and as a reminder of some of the significant things you have seen. This Building was constructed and its exhibits prepared in the hope that they would be a source of information and inspiration to the millions of Century of Progress visitors. Much of their value lies in the memories you will carry away with you. We have been glad to see you, and if you should have an opportunity to visit the River Rouge Plant as well as the Ford Museum, Edison Institute and Greenfield Village at Dearborn, you may be assured of a cordial welcome.

Century of Progress, Chicago, 1934.

FORD MOTOR COMPANY



THE HENRY FORD CENTURY ROOM

The Century room depicts one hundred years of mechanical progress. In it are contained many interesting mechanical exhibits from the Ford Museum at Greenfield Village as well as some of the most modern machinery and precision instruments from the great Ford River Rouge Plant at Dearborn.

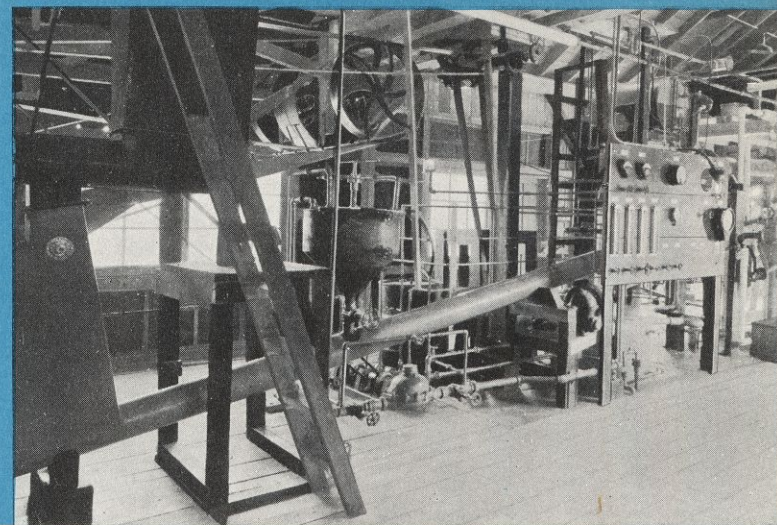
It includes Mr. Ford's first workshop which stood on Bagley Avenue, Detroit, and from which one day in 1893, he wheeled out the first Ford car for its initial road test. This first Ford is also shown. This car has been maintained in excellent mechanical condition and is still able to travel under its own power.

An interesting feature of the Century Room is a machine shop of a hundred years ago with the equipment which was the last word in efficiency from 1834 to 1880. Today it seems unbelievably crude. And even as late as 1893, the mechanical facilities available were so meagre that they would have been utterly inadequate to build a modern automobile. In this Exhibit group also are four of Thomas A. Edison's early electric generators which have been restored to their original condition and furnish light for part of the Century Room exhibit. Several early American engines and other mechanical devices which contribute to the story of power development are also displayed in this room. One of the principal purposes of this educational exhibit is to teach that the need inspires the means if only the minds of men are open to create.

THE INDUSTRIAL BARN



A feature of the Ford Exposition is the industrial barn and its equipment for extracting soy bean oil. Mr. Ford believes that agriculture and industry should be brought closer together and that the soy bean offers an example of what might be done to increase farm income. Results of experiments made at the Edison Institute are made available here for those who are interested. The building, an ordinary old barn, was moved from Dearborn to the Exposition—neither the equipment, most of which is made from standard piping, nor the machinery is expensive. The barn also houses equipment for making plastic objects out of soy bean meal and a general utility machine shop.





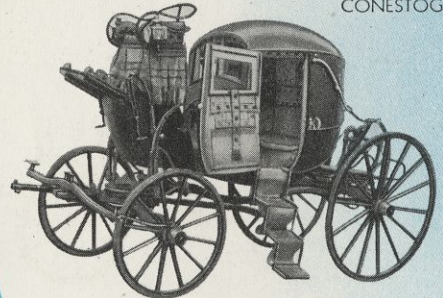
CHARIOT 1358 B.C.



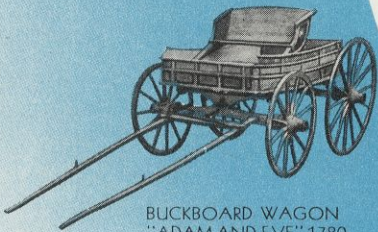
INDIAN OX CART
PRIMITIVE TYPE



CONESTOGA WAGON 1750 1850



CAMPBELL COACH 1760



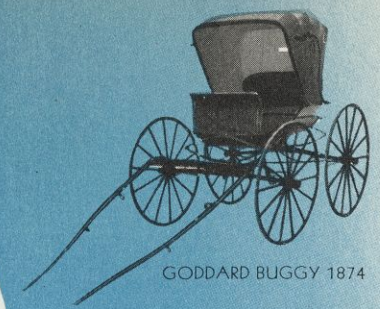
BUCKBOARD WAGON
"ADAM AND EVE" 1780



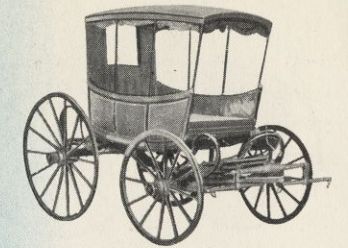
THE DRAMA OF TRANSPORTATION

The evolution of transportation is shown by one of the most interesting collections of vehicles ever assembled • Beginning with a reproduction of King Tutankhamen's state chariot which was copied in England, from the original, it shows the development

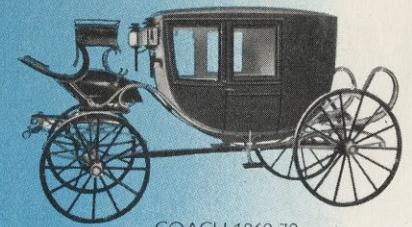
of wagons and coaches up to the advent of the automobile. The exposition is rich in specimens of American coach work dating back to the Campbell coach built in 1760 and including many examples of the work of Brewster, Cunningham and Dawson.



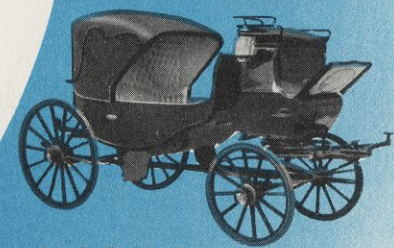
GODDARD BUGGY 1874



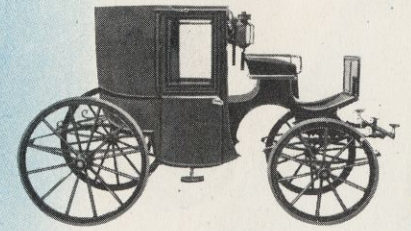
MEADVILLE, PA.
4 WHEEL CHAISE 1812-1827



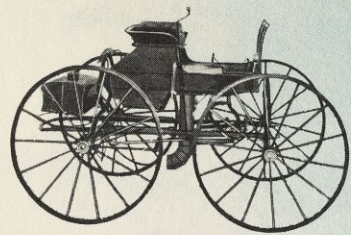
COACH 1860-70



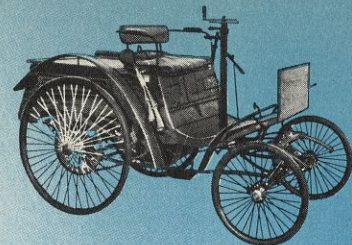
BAROUCHE 1875-85



WHITE HOUSE BROUGHAM 1902



AUSTIN 1861-63



BENZ VELOCIPEL 1892

HORSELESS

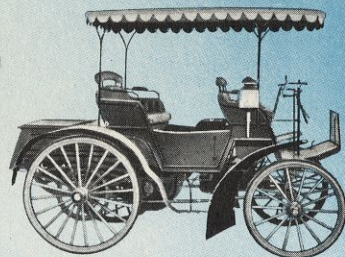
Here are a few of the many examples of early "motor cars" in the Ford collection, covering the period 1863 to 1909. While Otto made the first practical internal combustion

CARRIAGES

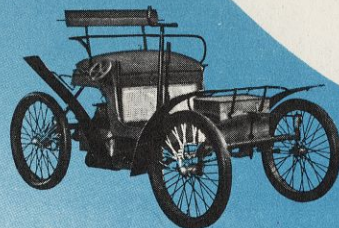
engine, Daimler was probably the first to use it successfully in an automobile. It will be observed that these earlier cars were buggies or carriages mechanically propelled.



DAIMLER 1894



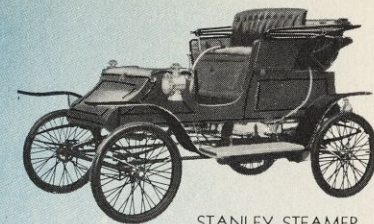
BENZ PHAETON 1892-96



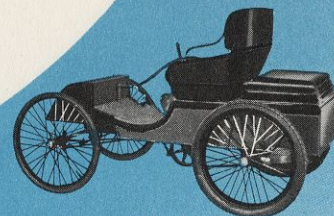
EISENACH 1898-99



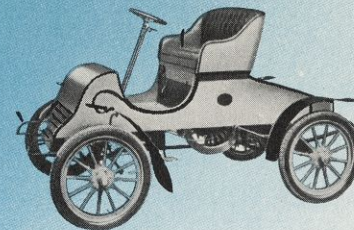
CRESTOMOBILE 1901



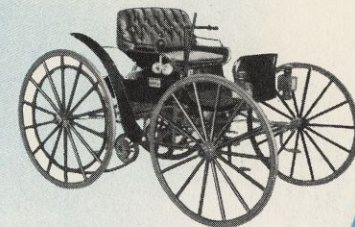
STANLEY STEAMER



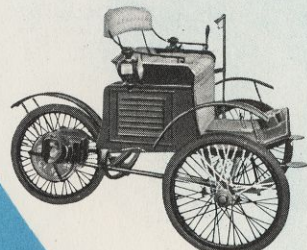
MICHIGAN 1903



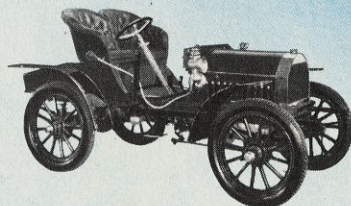
CADILLAC 1903



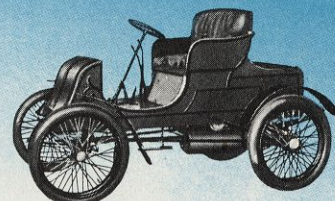
HOLSMAN 1903



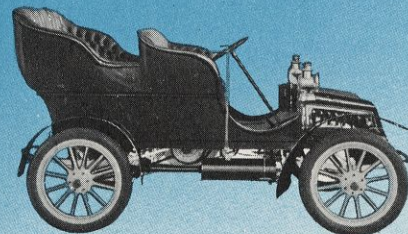
RIKER ELECTRIC TRICYCLE 1896



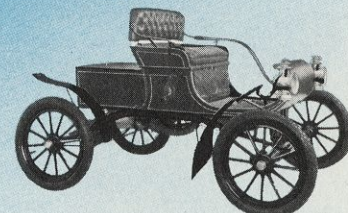
PIERCE 1904



WINTON 1900-01



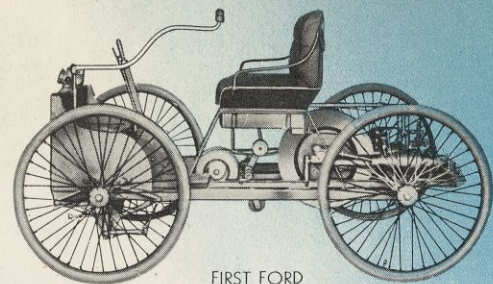
POPE-HARTFORD 1904



OLDS 1900



SCHACHT 1909



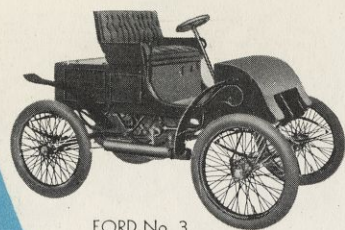
FIRST FORD

EVOLUTION OF

The cars shown on these pages are Fords. Although they are only a few of many in the Ford collection, they are highly representative and show clearly the transition from the first

THE FORD CAR

Ford, shown in the upper left-hand corner, to the modern Ford V-8 car of today. In the Ford Museum at Dearborn, Mich., are 220 automobiles, 560 horse-drawn vehicles.



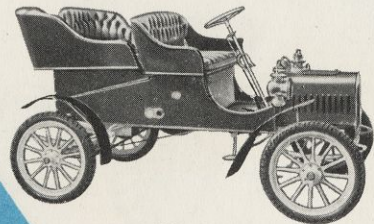
FORD No 3



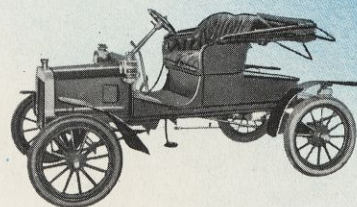
FORD "A" 1903



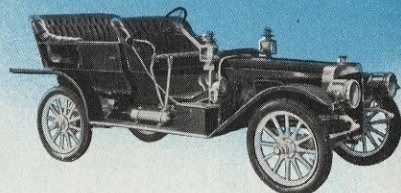
FORD "B" 1905



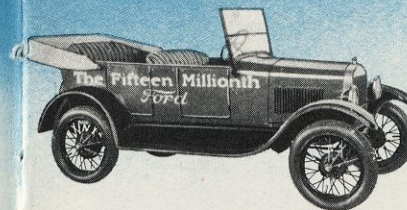
FORD "C" 1905



FORD "N" 1906



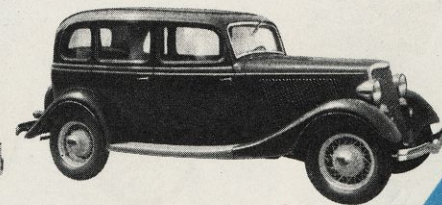
FORD "K" 1906-7



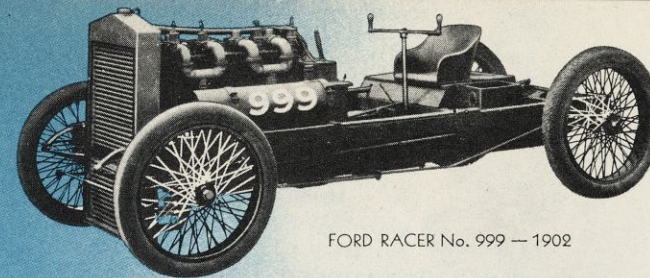
FORD "T" 1927



FORD "A" 1931



FORD V-8 1934



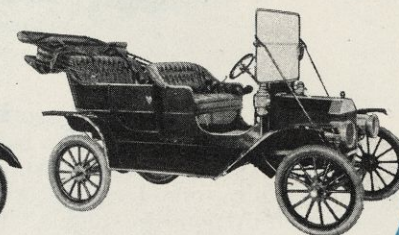
FORD RACER No. 999 — 1902



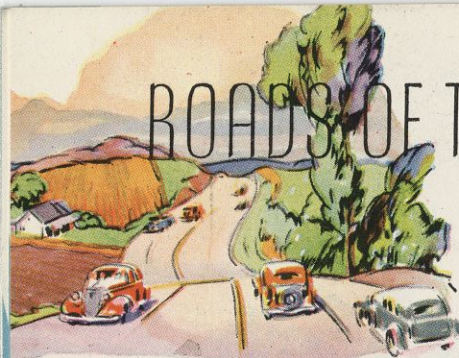
FORD "R" 1907



FORD "S" 1908



FORD "T" 1908



LINCOLN HIGHWAY UNITED STATES

ROADS OF THE WORLD

Road building was one of the first steps in developing civilization. Although the Romans generally are given credit for being the earliest road builders, the Egyptians had

paved roads at the time the great pyramids were constructed—thousands of years before.

The 21 kinds of roads shown at the Ford Exposition are faithfully reproduced according to the most accurate information obtainable. They range from the earliest Roman types to the most modern highway construction. The road from Antioch, Syria, to Bagdad, Iraq, is believed to have been built by the Romans.

The historic Appian Way was begun by Appius Claudius about 312 B.C.

The oldest type American road reproduced is the Mexican highway from Ixtlan to LaQuemada constructed by the Spanish Conquistadores about 1550 A.D.

The Chinese road from Pieping to Western Hills was paved about 1708 A.D. It was made of large stone blocks. A Chinese proverb says that stone roads are a blessing for a few years and a curse for centuries.

The roads of India were mostly of beaten earth, and were used only in the dry season. The British found it necessary to construct modern highways. The Calcutta-Afghanistan road had been in use since 2000 B.C. but was not surfaced until 1848. The most durable of all paving is stone setts, Belgium block, represented by the Belgian Lierre to Aerschot road built about 1800.

Russia is believed to have been first to pave with cylindrical blocks of wood. Chicago had a pine block

pavement in 1856; cedar blocks were substituted in 1875. Canada, like Russia, had a surplus of timber and in 1835-36 Lord Sydenham, who had long lived in Russia, introduced the plank road, at Toronto, Ont.

A specimen of the old North American Wilderness Trail shows what our ancestors endured. The Lancaster turnpike from Philadelphia to Lancaster, constructed in 1792, was the first stone road in the United States. The first brick road in this country from Cleveland to East Liverpool, Ohio, was built in 1909, although brick paving had previously been used in cities.

"Kleinpflaster" pavement, common in Germany, is virtually unknown here. A hard, tough rock is broken into cubes, placed in a light cushion of sand with concrete or old macadam base as a foundation.

France was the first to use rock asphalt in the Route de Quarante Sous from Paris to Havre, built in 1854. The "Diamond Rush Road" from Port Elizabeth to

Kimberley, South Africa, built in 1870 is one of the best known gravel roads of that continent.

Egypt's great caravan route which runs north through the Sahara is another highway that has been in constant use thousands of years.

The Lincoln Highway, from New York to San Francisco is represented by modern concrete pavement.

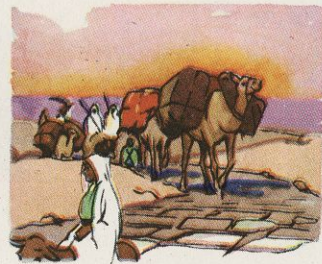
Brazil has in the Avenida Rio Branco, Rio de Janeiro, one of the most famous plazas in the world. It consists of three miles of mosaic, each section of which is laid in a different pattern.



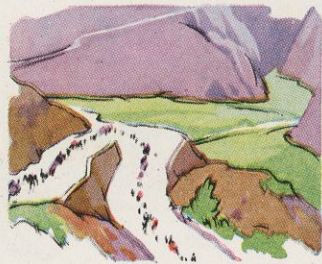
APPIAN WAY ITALY



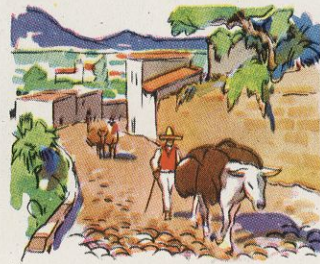
SUMMER PALACE ROAD CHINA



ROAD TO BAGDAD IRAQ



GRAND TRUNK ROAD INDIA



CORTEZ ROAD MEXICO



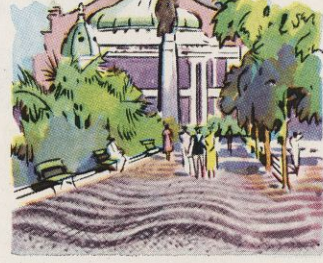
BERGSTRASSE GERMANY



ROUTE DE QUARANTE SOUS . . . FRANCE

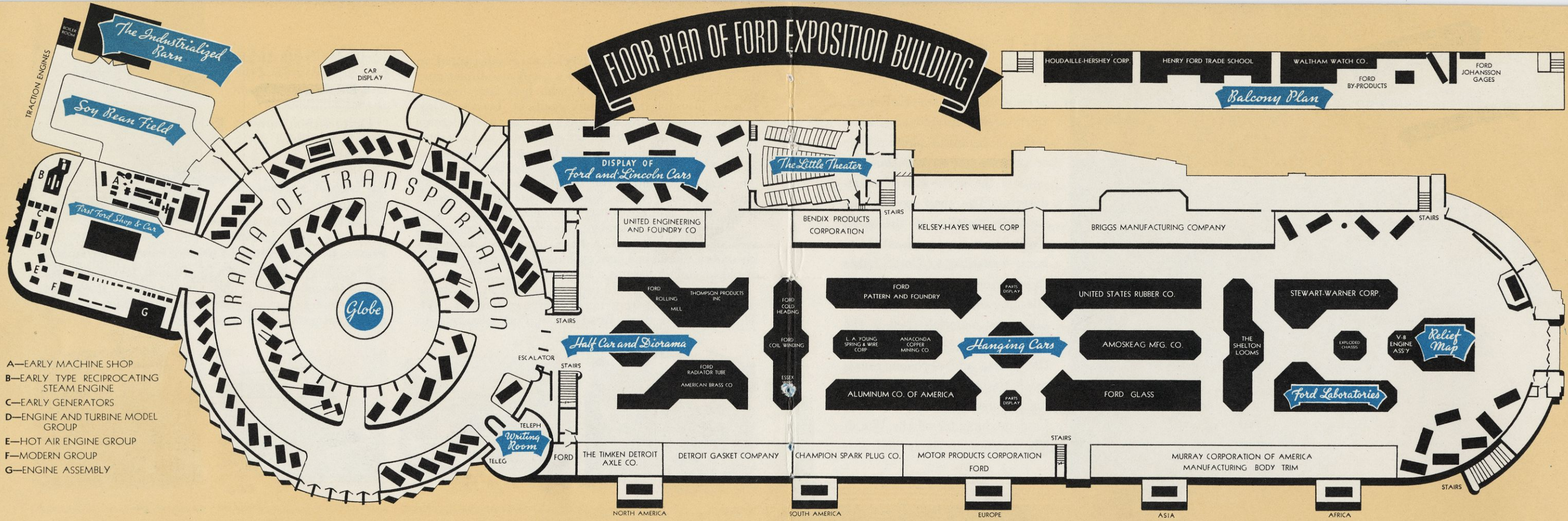


WATLING STREET ENGLAND



AVENIDA RIO BRANCO S. A.

FLOOR PLAN OF FORD EXPOSITION BUILDING



- A—EARLY MACHINE SHOP
- B—EARLY TYPE RECIPROCATING STEAM ENGINE
- C—EARLY GENERATORS
- D—ENGINE AND TURBINE MODEL GROUP
- E—HOT AIR ENGINE GROUP
- F—MODERN GROUP
- G—ENGINE ASSEMBLY



THE HEART OF

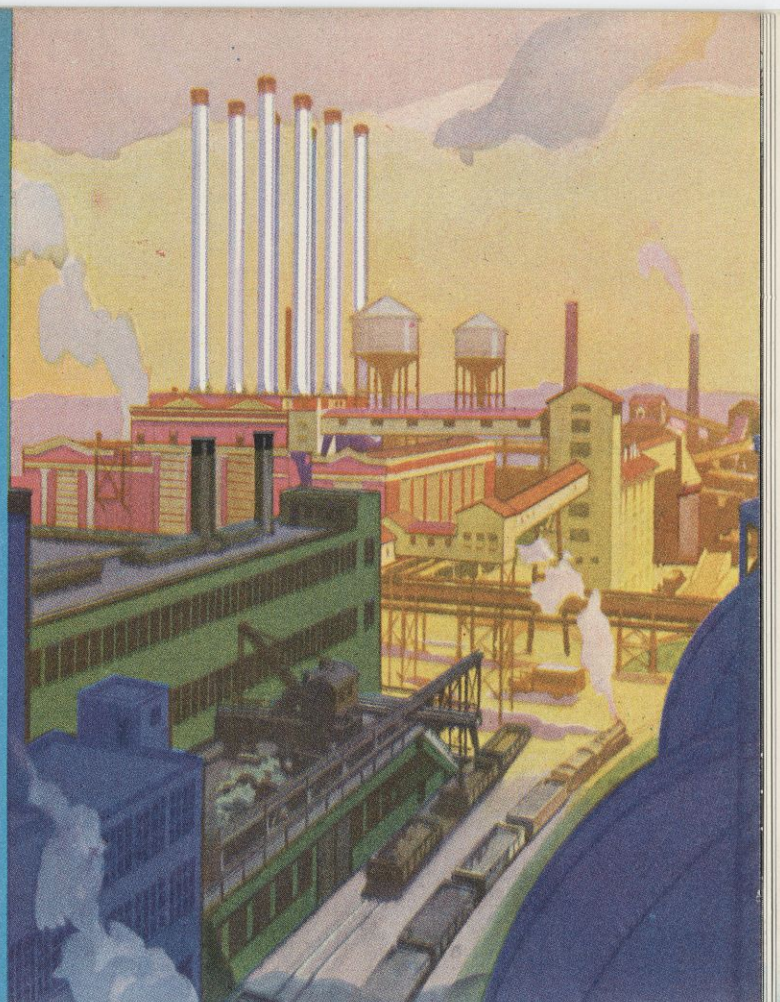
In a huge bas-relief map, thirty feet square, and in a series of beautiful photographic murals are shown the principal units of the world-wide Ford industries. The map reveals the strategic location of the great River Rouge Ford plant, at Dearborn, accessible to Great Lakes shipping and convenient to supplies of coal, iron ore, timber and other raw materials used in the building of cars. Ford boats ply the lakes, and through canals reach the Atlantic ocean, bringing in materials and carrying Ford products for all the World. The location is convenient also

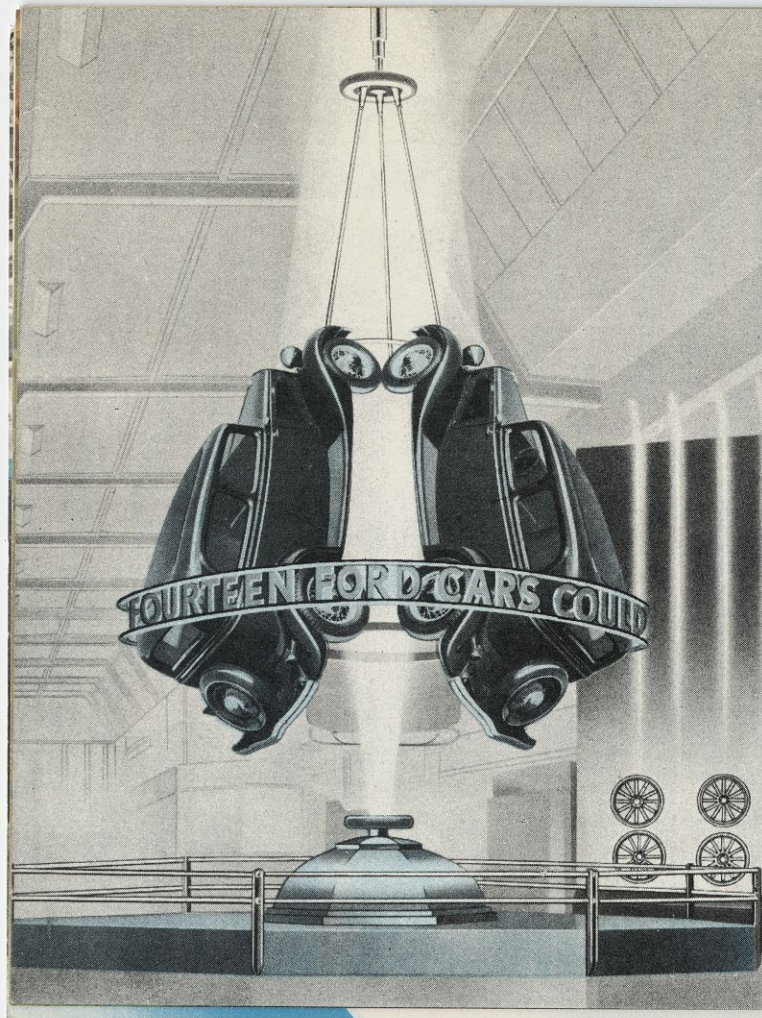
THE FORD INDUSTRY

for rail shipments, as it is served by five of the country's great trunk lines.

The River Rouge plant is one of the largest industrial units in the world as well as one of the most famous. Thousands of people visit it every year. All are welcome. The plant is devoted principally to the conversion of raw materials as well as to the construction of engines and other precision automobile parts. It has nearly seven million square feet of floor space and miles of railroads, docks and roads. It contains blast furnaces and coke ovens, a huge steel plant and one of America's most modern power houses. The plant covers 1096 acres.

Within a short distance from the River Rouge plant are the Ford Engineering Laboratories at Dearborn, the Edison Institute, the Ford Museum, Greenfield Village and the delightful Dearborn Inn.





THE PROOF OF SAFETY

One of the striking exhibits in the Ford Exposition Building is the suspension of three automobiles from the rim of a centrally-supported welded steel wheel such as is used on all Ford V-8 cars. Elsewhere is demonstrated the electric welding of these steel-spoke wheels into one solid unit.

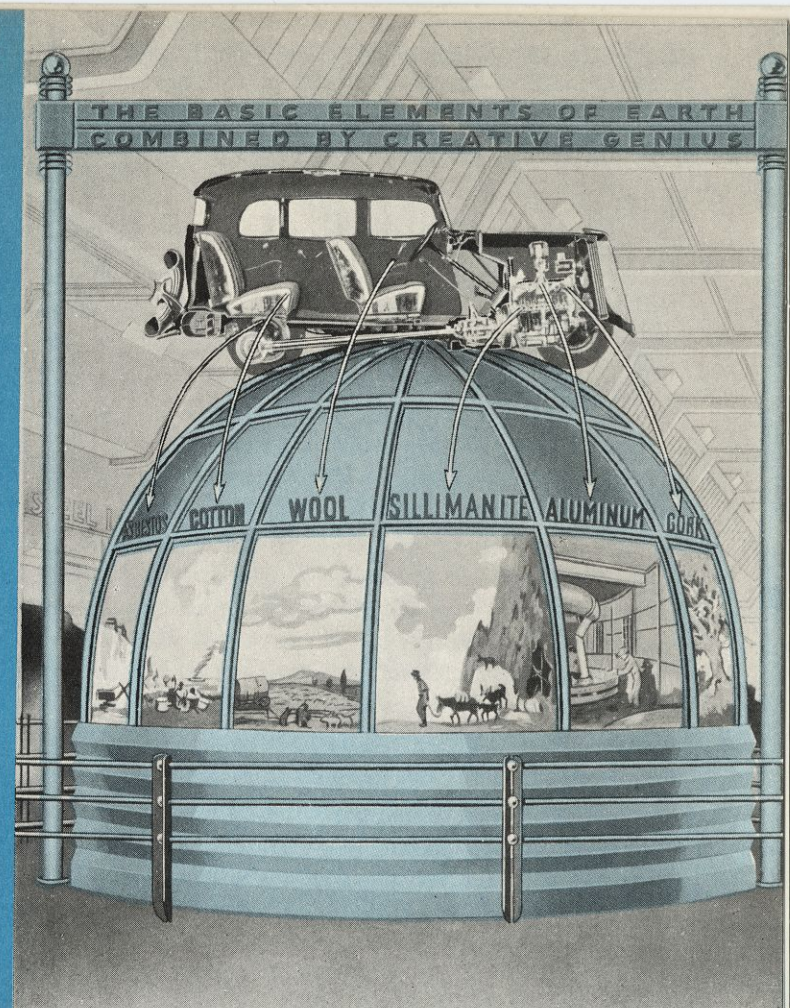
Actually the wheel is strong enough to support fourteen cars having a total weight of approximately twenty tons. Similar exhibits, beautifully and clearly displayed show the strength, accuracy and purpose of other parts which give the Ford its strength, economy and dependability. The purpose of the entire Exposition is educational, presenting in graphic, entertaining form, the fascinating story of the motor car which plays such an important part in the life of American people.

OUT OF THE EARTH

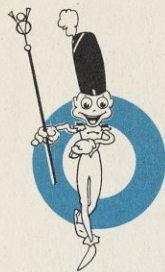
Out of the earth come the materials that make the modern automobile. Man takes the basic materials from the soil and his ingenuity transforms them into fabricated products.

Dioramas illustrate the sources of the materials that go into the car. Iron, copper, glass, zinc, cotton, wool, cork, asbestos, rubber, aluminum, sillimanite and soy beans. The various processing and machining operations in the main building show how they are manufactured. While it is not possible to show every step, mechanically, gaps in the processes are graphically bridged by exhibits, photographs and lectures.

Mounted on top of the hemisphere is a Ford V-8 car, cut in half, to give a graphic idea of the way materials are fabricated and used.



RHAPSODY IN STEEL

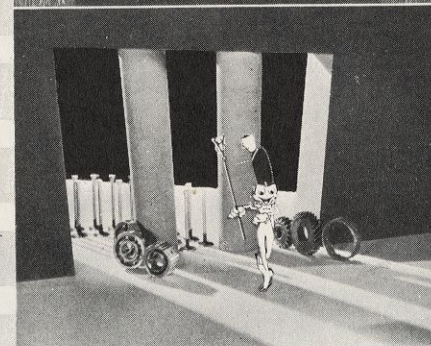
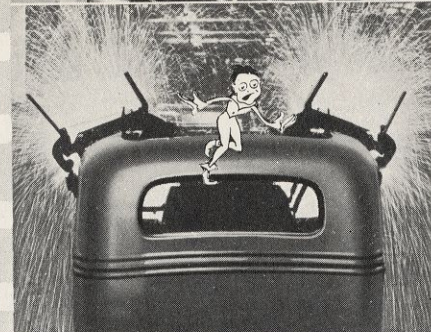
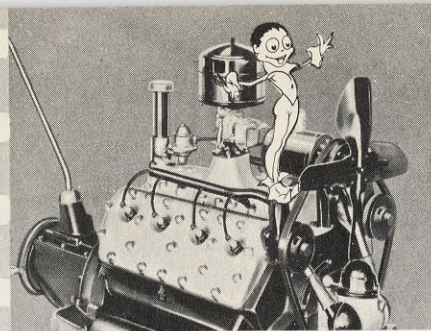


NE of the entertaining features of the Ford Exposition is the sound motion picture "Rhapsody in Steel" which was developed especially for Century of Progress visitors. This is an amusing fantasy which in a novel way gives a good conception of the magnitude of the Ford industry and the many operations in the building of a Ford car.

Against the serious background of the drafting room, the laboratories, foundries and shops the Ford imp, a whimsical character which creates itself out of the V-8 radiator emblem, makes its appearance. When endowed with life he weaves his magic spell over a staid collection of parts, making them behave in a most surprising and frivolous manner. The dance of the connecting rods, the parade of the parts and many supernatural pranks are well worth seeing.

The musical score was actually composed in the Rouge plant. It interprets sound effects incident to building the Ford V-8 car.

"Rhapsody in Steel" and the "Human Ford" which talks and performs are shown continuously in the Ford Exposition Theatre.



THE BASIC ELEMENTS OF EARTH COMBINED BY CREATIVE GENIUS

MANKIND PASSES FROM THE OLD TO THE NEW ON A HUMAN BRIDGE

FORMED BY THOSE WHO LABOR IN THE THREE PRINCIPAL ARTS

AGRICULTURE • MANUFACTURE • TRANSPORTATION

★ IRON and STEEL ★

How iron is made in the blast furnaces at the River Rouge plant is described in this Ford exhibit, followed by how it can be cast in strong rugged forms. Iron is the basis of steel and all great manufacturing enterprises are found where iron ore and coal can be readily made available in large quantities. • In the Ford foundry exhibit one sees all the intricate steps involved for casting iron. The pattern shop shows the metal patterns for casting Ford V-8 cylinder blocks. The display stands show the various steps in preparing a mould for casting. The cross section of the mould shows how the walls and cavities are formed. • The next section of this exhibit

demonstrates how sand cores for push rods, using soy bean oil as a binder, are formed. The cores are then baked and made ready. In an electric furnace, furnished by the Pittsburgh Electric Furnace Company, a special wear-resisting iron is melted. Now after the cores are set in the permanent moulds of the rotating die casting machine they are filled with molten iron. As soon as the metal becomes solid the castings are automatically ejected. • The Kelsey Hayes Wheel Company shows how steel is used for making wheels. In this the rims and spokes are made into Ford one piece steel-spoke wheels by an ingenious welding process. • The Briggs Body Company shows the newly developed welding process by which the panels and steel braces making up a Ford

body are welded into one piece, combining lightness with great strength and rigidity. • At another "island" one sees the L. A. Young Spring and Wire Company making seat cushion springs from steel wire. • Steel, which is made from iron, is always associated with strength. Fifty-one kinds of steel are used in manufacturing the Ford car, 36 of which are in the car itself. • Steel can be rolled into thin sheets which can be shaped and welded into a strong, rigid unit. The rolling of sheet steel is illustrated by a working model in the United Engineering & Foundry Co.'s exhibit. • At the Ford Steel Exhibit the method of manufacturing and hot rolling of steel is displayed. • An electric furnace heats billets which are then passed through a bar rolling mill. Next these bars are cut to length. • The Thompson Products Company now takes the bars, reheats them, and by a process known as "hot heading" shapes them into Ford steering-gear drag links.

★ ALUMINUM ★

Aluminum is extensively used for several reasons. It is light in weight. It can be rolled, forged or cast. Its heat conducting qualities are remarkable, hence its use for cylinder heads. Ford pistons are also made of alumi-

num because of its lightness. • The Aluminum Company of America shows the various steps in making aluminum from the raw material, bauxite. They also demonstrate how Ford cylinder heads are cast.

★ COPPER ★

Copper is used extensively because it has certain basic characteristics. It is rust resisting, highly ductile and is an excellent conductor of electricity and heat. • The Anaconda Copper Mining Company sponsors this exhibit. • After illustrating how copper ore is mined and the refined metal produced, The American Brass Company alloys it with zinc to make brass, rolls it into sheets and splits it into ribbonlike strips. • The Ford Motor Company then takes the brass strip stock and shows how radiator tubes are produced. A cutaway section of a radiator core shows how these tubes are assembled to form the unit. • The Essex Wire Corporation shows how copper wire is drawn and made into the various cables used on the Ford car. • The winding and taping of generator field coils as shown at the Fair is a duplicate of the operations performed at the small Ford plant at Ypsilanti, Michigan, one of the examples of factory decentralization.

★ ZINC ★

Zinc is relatively non-corrosive and can be die cast in intricate shapes in permanent moulds to accurate dimensions. It can be plated with metals which provide a permanent bright finish and is alloyed with copper to make brass. One of its principal uses in Ford cars is for carburetor and fuel pump parts. The Anaconda Copper Mining Company is sponsor of the Zinc exhibit.

★ GLASS ★

Glass is composed principally of sand, limestone and soda ash. Its properties include transparency, hardness, resistance to the natural elements and to most chemicals. • The laminated safety glass used in Ford cars is shown in the process of manufacture. The glass sheets are cut to uniform size. They are then washed, inspected, sprayed with cement and dried in an oven. A sheet of cellulose acetate is next inserted between two sheets of glass and the "sandwich" made. The sand-

wich is then run through a pair of rubber rollers which "tack" the three parts together. Then it is subjected to a high pressure and temperature. The edge is undercut and sealed to prevent deterioration. • The edges are ground and the now complete safety glass after etching the maker's identifying mark is washed and packed.

★ RUBBER ★

The automotive industry is by far the largest consumer of rubber, even though it is universally used for other purposes. When compounded with certain chemicals and vulcanized, it has many desirable properties; especially elasticity, resiliency and resistance to abrasion. Moreover it can be made hard, soft, tough, light, heavy or even liquid. As a protection against shortage of rubber or excessive prices, the Ford Motor Company has undertaken a large rubber-growing program in the vicinity of Boa Vista, Brazil, although this plantation is not yet in production. • The United States Rubber Company's exhibit shows many stages in the processing of rubber into products for commercial importance.

★ SILLIMANITE ★

Sillimanite is an aluminum silicate used in the manufacture of spark plugs. Its physical properties include strength at high temperatures—resistance to great changes in temperature, mechanical strength and resistance to the chemical action of gases. • The Champion Spark Plug Company shows the various operations in manufacturing spark plug insulators. First there is a display of the mineral. This is ground to powder, mixed with water and run over a "Lawn" which removes all foreign matter. It is then filtered and the clay put through a machine which forms the rough blanks and pierces the electrode hole. After turning and glazing, the porcelains pass through the firing kilns.

★ CORK ★

Cork is the light, porous, elastic outer bark of the cork tree. Most of it grows in Spain though a little is raised in Portugal, Northern Africa and Sardinia. It is noted for its lightness, heat insulating qualities, resiliency and

resistance to the action of lubricants. It is waterproof and can be compressed so as to conform to the contour of various surfaces. The Detroit Gasket Company demonstrates the properties and use of this material.

★ ASBESTOS ★

Asbestoes can almost be called a freak of nature inasmuch as it is a fibrous mineral. It can be produced in sheet form in much the same manner as paper. Its high resistance to heat makes it especially desirable for brake lining, clutch facing and gaskets. The Detroit Gasket Company shows its use in their "Steelbestos" gaskets.

★ COTTON ★

Cotton has an unusually wide range of uses. In fabrics it has good wearing qualities, takes color well and is strong. It offers greater resistance to high temperatures than wool, and for this reason it is used to reinforce asbestos in woven brake linings. In the Ford car it is used for padding, lining, as cellulose nitrate in lacquers and as cellulose acetate in safety glass. • The Amoskeag Manufacturing Company has an interesting exhibit,

showing how cotton is made into cloth. Beginning with raw cotton it shows the ginning, spinning and weaving process as well as display of cotton cloths.

★ MOHAIR ★

Mohair, a popular fabric for upholstery because of its wearing qualities and attractive appearance, is made from the hair of the Angora goat. These animals were originally natives of Asia Minor but are now raised in the United States in large numbers. The Shelton Looms illustrate how mohair is woven into fabric.

★ WOOL ★

Wool has been the most popular material for textiles since the dawn of history. It is a natural covering and the attributes which make it desirable for clothing—wearing quality, strength, resiliency—are equally valuable in automobile upholstery. Only fine, long-fibre wool is used in Ford broadcloth.

★ OTHER EXHIBITS ★

There are a number of other interesting exhibits at the Ford Exposition that deserve mention. The United

Engineering and Foundry Company shows a model of a modern continuous steel strip mill in operation. The Murray Corporation of America has an immense exhibit with some marvelous machinery for making automobile upholstery. • Timken-Detroit Axle Company roughs out and finishes gears for the truck rear axle, working to very close limits. The Waltham Watch Company makes watch parts so minute that the process seems almost impossible. • At the Stewart-Warner Corporation's exhibit, speedometers are assembled and the evolution of the speedometer is featured. The Bendix Products Corporation assembles and tests carburetors. The Bendix braking system and starter drive are also displayed. On the balcony the Houdaille-Hershey Corporation demonstrates its shock absorbers and Ford transverse springs. • The American Brass Company has an educational Exhibit which includes a sheet brass rolling mill in operation. • The use of steel for the instrument board has long been desirable, but never popular until a method of metal graining which makes steel resemble wood, was developed. This process is shown at the Motor Products Corporation exhibit.



OLD LABORATORY OF
THOMAS A. EDISON



THE LEGENDARY GIANTS
GOG AND MAGOG



THE CHAPEL OF
MARTHA MARY

Greenfield Village

One of the country's show places, daily growing in national popularity, is the Ford Museum at Dearborn, Michigan. In addition to the most unique collection of American relics ever assembled there is the Edison Institute, rich in memories of the Great Inventor, and Greenfield Village, a typical early American town re-created into a living community.



THE OLD COUNTY STORE
OF HALF A CENTURY AGO

