REMOWING FIRESTONE GUM-DIPPED TIRE FROM
AUTOMATIC CURING MOLD IN FIRESTONE
FACTORY AND EXHIBITION BUILDING.
A CENTURY OF PROGRESS.

saftest tires that human ingenuity has created.

Harvey S. Firestone
Firestone Automatic Curing Molds

After all the component parts of the tire have been assembled—high-stretch Gum-Dipped cords—plies—beads—two extra Gum-Dipped Cord Piles under the Tread—and the Tread Rubber itself—the tire is placed in a gigantic curing mold.

In this final important operation, the tire is forced by 43 tons pressure into the Firestone non-skid tread pattern engraved in the steel mold and vulcanized by steam at 270°F.

POST CARD

PLACE

STAMP

HERE

Copyright 1923
The Firestone Tire & Rubber Co.

Firestone is a privilege and a great pleasure to welcome you to the Firestone Factory and Exhibition Building and to our Exhibit in the Hall of Science where not only the scientific development of rubber, but also some of the finest and most modern and efficient rubber products will be of interest to you. We realize that the lives of thousands of men, women, and little children are often dependent upon the tires. Deeply concerned about this responsibility, we have incorporated our most modern and efficient machines, creating by our own engineers, the safest tires that human ingenuity has created.

Firestone Tires are made from the finest natural rubber available. Extraordinary male engineering, making it possible for us to manufacture tires embodying a greater degree of safety and quality than is found in any other tire.

I hope that the Exhibit of the growing and preparation of rubber, the manufacture of Firestone Tires and the dynamic exhibits of our automobile products will be of interest to you.

The Firestone Plantations in Liberia, Africa, the world's largest and finest natural rubber grower, are shown in our Exhibit, where not only the scientific development of rubber is shown but also some of the finest and most modern and efficient rubber products will be of interest to you.

The Mark of Quality

© Firestone

[Signature]

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© Firestone
Building FIRESTONE TIRES at "A CENTURY of PROGRESS"

RUBBER

Rubber in its virgin form is a milky white liquid that is collected from rubber trees. It is prepared at the plantation in rubber sheets, packed in bales and shipped to Firestone factories direct from the plantations in the Far East and Firestone's own rubber plantations in Liberia, Africa. Rubber of the highest quality is used in Firestone products.

COTTON

Cotton is purchased in the primary markets and shipped to Firestone Cord Fabric Mills. These mills, one of which is the largest in the world, have a total yearly capacity of forty-five million pounds. The Firestone cotton warehouse at New Bedford, Massachusetts, with a storage capacity of 100,000 bales, provides a supply at all times of highest quality cotton.

MILLING

The first step in the preparation of the rubber from which the various component parts of tires are made, is the compounding or mixing of the crude rubber with pigments and chemicals. Firestone not only uses the best grades of rubber, but the finest chemicals and in the right proportions—and has recently developed a process of more completely dispersing these chemicals or pigments throughout the rubber, giving the rubber greater life and much longer wear.

GUM-DIPPING

This is an exclusive Firestone development and is an extra process which adds eight pounds of rubber to every 100 pounds of cord fabric, and is used only in the building of Firestone tires. By this process every cotton fiber within every cord is thoroughly saturated and surrounded with pure, live rubber, which reduces internal friction and heat, and adds greatly to the strength of the tire, increases flexing life of cords and is the outstanding factor in eliminating heat, preventing blowouts and prolonging the life of the tire.

From raw cotton to cords

The 35-ton crude rubber mixing machine

The Firestone Gum-Dipping machine—designed and built by Firestone engineers—which by a patented process saturates and coats every cotton fiber in every cord with pure rubber
CALENDERING

After the cords are Gum-Dipped by the patented Firestone process, they are passed through a huge calendering machine, where a layer of fine, high grade rubber compound is applied on both sides of the Gum-Dipped cords.

This protects the plies against friction and increases the strength of the tire body, provides easier riding and greater strength.

PLY CUTTING

After the Gum-Dipped Cord Fabric is coated on both sides with this high grade rubber compound, it passes into the ply cutting machine and then is cut on the bias to exactly the proper width and is then ready to be made up into the body of the tire. The materials are now ready for the tire builder.

TIRE BUILDING

This machine, developed by Firestone, automatically feeds the rubberized Gum-Dipped cord plies to the tire builder, who assembles the plies, beads, and treads on a revolving flat drum to form the proper build-up of the tire.

Automatic means control the operation of this machine so efficiently that tires of uniform construction and quality are assured.

EXPANDING AND FORMING

The Gum-Dipped Cord Plies, one built upon the other, the Two Extra Gum-Dipped Cord Plies under the Tread, and the Tread Rubber, are now transferred to the expanding and forming machine. Here a rubber airbag is automatically inserted on the inside of the tire and the tire formed ready for the curing mold.
VULCANIZING

Pictured at the left is one of the many modern Firestone Steam Jacketed Molds, which automatically open and close by gleaming pistons high overhead, as thermostats assure the most accurate temperature control. Colored lights flicker to indicate the progress of the operation. Steam provides the necessary heat for the vulcanization.

As heat is applied to the rubber, vulcanization takes place due to the chemicals that have been mixed with the rubber. After the tire has been vulcanized for a certain period of time, the heat transforms the compound into a live, tough, long-wearing rubber. At the same time tremendous pressure exerted on the airbag inside the tire forces the tread rubber out into the non-skid tread pattern of the mold and makes the scientific and efficient non-skid tread design.

AIRBAG EXTRACTING MACHINE

After the tire has been vulcanized and is taken out of the mold, it is then put into a machine, known as the tire expander, where the tire is forced open to permit the extraction of the airbag on the inside.

FINISHING AND INSPECTING

The tire is now put on the conveyor again and is taken off at the finishing and tire inspection machine. Here a master craftsman examines and inspects the tire for any possible imperfection, washes and polishes the tire, applies gold striping and the Mark of Quality insignia.

Thus, each Firestone tire becomes The GOLD STANDARD OF TIRE VALUES.

WRAPPING AND LABELING

The tire is next sent to the wrapping machine, where the operator again carefully examines the tire, inserts it in the machine that automatically wraps it securely in paper, places upon it the proper label—and the MASTERPIECE OF TIRE CONSTRUCTION is ready for shipment.
**AT FIRESTONE FACTORY**

Demonstrating the smooth braking action and positive braking control of Firestone Aquaprufl Brake Lining compared to old type linings. This new lining provides perfect stopping action in wet or dry weather. It gives long wear, free from chatter and squeal.

**FIRESTONE BRAKE LINING DEMONSTRATION**

In one of the large show windows is exhibited the first racing car to win the 500-mile Indianapolis Race in 1911. Also, one of the winning cars in the 1933 annual classic. For 15 consecutive years Firestone Tires, built with Gum-Dipped High Stretch Cords, have been on the winning car in this, the most gruelling test of tire dependability the world has ever known.

*One of the winning cars in the 1933 Indianapolis Race*
OTHER DISPLAYS AT FIRESTONE FACTORY

Beautiful, modernistic turn-tables show the many different types and lines of footwear and other rubber articles manufactured by Firestone.

FOOTWEAR DISPLAY

 Outstanding displays in the buildings surrounding the Firestone Gardens and in the Firestone Factory and Exhibition Hall demonstrate vividly the many high quality products that Firestone provides car owners—the long dependable service that Firestone builds in its truck and bus tires—the extra power and construction features that Firestone builds into its complete line of batteries.

FIRESTONE "ALL PRODUCTS" DISPLAY

23 ROUND TRIPS TO THE MOON — FIRESTONE HIGH SPEED BUSES TRANSIT FROM EARTH WITH MILLION MILES DOWN THE LITTLE HOUSE ON THE PLANE IN THE WASHINGTON & O' Connell ELECTRIC CO WITHOUT ONE MINUTE'S DELAY DUE TO THE POWER!

FIRESTONE TRUCK AND BUS TIRE DISPLAY

FIRESTONE BATTERY DEMONSTRATION

Firestone Battery supplies power to lift a 250-pound steel ball 1,080 times every day—power enough to start the average car 247 times a day.

MECHANICAL RUBBER GOODS DISPLAY
DISPLAY OF FIRESTONE

FIRESTONE HAS THE DISTRIBUTION AND SERVICE

Firestone pioneered and organized the greatest distribution and service system in the world.

Six hundred Firestone owned and controlled distributing points are strategically located throughout the United States to give twenty-four hour service to 30,000 service dealers and service stores in practically every town and city in the country.

This one-profit low expense system was organized to give car owners greater value with more efficient service and lower cost, saving motorists millions of dollars annually.

ONE-STOP SERVICE STATION

GREATEST DISTRIBUTION SYSTEM IN WORLD

The tire department

The gas island

Lubrication department

Battery department

The brake department

Ignition department
FIRESTONE SINGING COLOR FOUNTAIN ONE OF THE MARVELS OF THE WORLD'S FAIR

From the Hall of Science on Lief Erickson Drive, one sees and hears the Firestone Singing Color Fountain, situated directly in front of the entrance to the Firestone factory and exhibition building. The six dome-shaped fountains of misty spray are situated in a beautiful pool 100 feet long, 15 feet wide, surrounded by beautiful lawns, flowers and hedges. The artistic fountain, with jets of water reaching a height of 20 feet, rises out of the pool in majestic beauty.

A concert of beautiful instrumental and vocal music is given day and night in this beautiful garden spot.

By means of delicate mechanism the music is perfectly synchronized with the many colored lights beneath the fountain domes, which produces every conceivable shading of colors in the water. The color variations are in perfect harmony and are actually operated by the varying tone values in the music that is being played.

It is the only installation of its kind in the world, and presents to each visitor an enchanting beauty that is never to be forgotten.

FIRESTONE MULTI-COLOR SHADOW SIGN ANOTHER MARVEL OF THE WORLD'S FAIR

Situated on top of the Firestone factory and exhibition building, eighty feet long, and rising majestically above the surrounding gardens is the first sign of its kind installed anywhere in the world. The sign is constructed of multiple planes behind which thousands of vari-colored electric bulbs are concealed. The sign reflects shadows in a never-ending combination of beautiful blues, greens, ambers, and orange, in varying intensity of brilliancy.

The operation of the sign not only creates a dignified beautiful spectacle, but it also creates amazement among the spectators, as the sign has a tendency to create the feeling that it is moving toward one in a succession of gorgeous color combinations that is a marvel of beauty.
**Firestone Factories**

*Worldwide Service*

Firestone factories are strategically located all over the world for the economical production and distribution of Firestone products. The Firestone factories have the greatest productive efficiency in the tire industry. Practically all the machinery is designed by Firestone engineers and manufactured in Firestone machine shops. In addition to Firestone’s own tire factories they have their own rubber preparation mills in Singapore—cotton fabric mills and warehouse in the United States—their own battery factories in Akron and Los Angeles—their own rim and wheel factory, spark plug and brake lining factories.

The tremendous savings in efficient manufacturing are passed on to the consumer in the form of extra quality and values built into Firestone products.
Firestone factories located throughout the world are served by groups of expert buyers who go to the primary sources of supply for rubber, cotton, and other raw materials that enter into the manufacture of Firestone products. Rubber buying offices in the Far East enable Firestone to secure crude rubber direct from the plantations. Firestone’s own rubber plantations in Liberia, Africa, produce crude rubber of unusually high quality.

Cotton is bought in the primary markets and shipped to the Firestone Cotton Warehouses. Direct buying of rubber and cotton results in tremendous saving in addition to the tremendous savings made in Firestone's factories, admittedly the most efficient in the world.

Quality materials bought in world markets at lowest prices, exclusive manufacturing processes, not enjoyed by other concerns, precision machinery, unexcelled manufacturing and distribution efficiency—all contribute to the Extra Values that enable Firestone products to save the consumer money and serve him better.
The Firestone Tire & Rubber Company was signally honored by being selected as the one rubber company in the Industry to present at the Hall of Science a complete scientific rubber exhibit. The World's Fair Committee requested Firestone to represent the entire Rubber Industry, one of the most romantic and interesting of all divisions of our modern commerce.

On one side of the exhibit, in the very center of the great Hall, occupying the most strategic position, is a graphic presentation, showing the gathering of rubber from wild trees in the jungle, as it was done fifty years ago, the coagulation and preserving process over smoky fires, and the forming of the rubber into large para biscuits.

On the other side is a presentation of rubber trees growing from bud-grafted stock on the modern Firestone rubber plantations in Liberia, Africa. Scientific exhibits include the chemical preparation of rubber caused by a certain acid being mixed with the latex. Another shows how rubber is being electrically deposited on metal.

Another exhibit shows the process known as vulcanization, which, briefly, is the application of heat to rubber that has been mixed with sulphur and other chemicals. This exhibit shows the increased tensile strength resulting from vulcanization, and how the time required for vulcanization has been shortened by the development of compounds known as accelerators. It is shown that the accelerators also impart to the product greater strength.

Another scientific exhibit shows how development of vulcanization eliminates the stickiness and plastic flow of raw rubber—and how the addition of certain finely divided solids incorporated into the raw rubber when vulcanized, stiffens, toughens, and strengthens the rubber to create long wear.

Another shows the greater energy stored by stretching a rubber band, compared with stretching a steel spring of the same weight, each measured by electricity as indicated by a neon light.

Still another interesting exhibit is rubber's resistance to wear as compared to steel, by subjecting it to the action of a jet of water containing sharp, erosive material.

It is also shown how the long life of rubber has been accomplished, by adding certain chemicals, which repel oxygen and help to keep the rubber from deteriorating.

These exhibits demonstrate how Firestone leads the industry.
FIRESTONE PRODUCTS

Firestone builds complete lines of tires of every type and size for passenger cars, trucks, trailers, buses, tractors, airplanes—and all kinds of industrial motor vehicles. Also Firestone batteries, spark plugs, rims, accessories, special rubber goods, and a complete line of rubber footwear. Firestone leadership is responsible for many major tire developments. These include the mechanical wired-on tire, now known as the Straight-Side Tire—rubber non-skid—demountable rims—patented Gum-Dipping process—original balloon tire—patented construction of two Extra Gum-Dipped Cord Plies under the Tread and pneumatic tractor tire.

THE MASTERPIECE OF TIRE CONSTRUCTION

"FIRESTONE HIGH SPEED TIRE"
The new Firestone High Speed Tire for 1934 is admittedly the MASTERPIECE OF TIRE CONSTRUCTION. A tire of higher quality, greater safety, and longer mileage than any tire built. It is in a class by itself.

FIRESTONE SEALTYTE LEAK-PROOF TUBE
The new Firestone Sealtyte Leak-Proof Tube is coated inside with a special compound which seals against air loss—flexible rubber stem. No chance for air leakage. Constant air pressure greatly increases tire mileage.

FIRESTONE PRODUCTS
Firestone Manufactures A Tire In Every Price Class for Your Car

FIRESTONE CENTURY PROGRESS TYPE
A new Firestone tire built to outwear any tire in its price class. Its deep, rugged, non-skid tread with its Gum-Dipped High Stretch Cord body gives many extra miles of safe service. OFFICE appearance, this tire is as modern as "A Century of Progress."

FIRESTONE OLDFIELD TYPE
A strong, sturdy tire, of low price, yet built to withstand the strains and shocks of fast driving on smooth or rough roads. For low cost mileage equip your car today with a set of these tires. This is "The Tire That Taught Thrift to Millions."

FIRESTONE SENTINEL TYPE
Built to high standards of Quality, Construction and Workmanship, this tire is ideal for replacement on your old car. You will get many thousands of miles of low cost service from these tires, before trading in your car.

FIRESTONE COURIER TYPE
This tire is of good Quality and Workmanship — carries the name "Firestone" and full guarantee — and is priced 'way down to meet the public's demands for a low cost tire for replacement on the small cars.
FIRESTONE PRODUCTS

FIRESTONE AIR BALLOON

Firestone Air Balloons set a new standard of style, provide a luxurious low-swung balance, provide easier riding comfort, fewer repairs, less depreciation, more road traction, and greater safety with quicker starting and stopping. A new motoring thrill.

FIRESTONE TRACTOR TIRE

Makes any tractor an all-purpose machine. Operates with only twelve pounds of air. In addition to plowing, discing and general farm work, tractors can now be operated on paved roads. Do more work each day with less cost. Less depreciation in equipment. No damage to barn or garage floors.

FIRESTONE RAIL TIRE

Firestone has developed, tested and proven a new type pneumatic cushion tire for railroad use. Provides smooth, quiet, safe, economical and fast transportation. It is easy to convert any car or bus for rail use with this tire. Very popular for inspection cars.

FIRESTONE PRODUCTS

FIRESTONE TRUCK AND BUS TIRES

Firestone makes a complete line of truck and bus tires, in all sizes and types, and in a complete range of prices, to meet every trucking requirement. These include all sizes of truck and bus balloons in two tread designs; high pressure pneumatics; Ground Grip type for extra traction in dump truck and contracting services, oil fields, logging, etc.; and solid tires.

FIRESTONE INDUSTRIAL TIRES

These tires are built in a great variety of types and sizes for industrial and electric battery trucks, as well as trailers, used by warehouses, railways and many manufacturing plants. They are made in three types of metal base—Band Type, flat steel base, rubber flush at edges of steel; Channel Type, extra wide with flanges at sides; Malleable Iron Base, which eliminates base separation from overload and side injury. They are both economical and quiet, and protect the merchandise due to their easy riding qualities.
FIRESTONE PRODUCTS

FIRESTONE COMPLETE LINE OF BATTERIES

Firestone manufactures a battery for every car, truck or bus in a complete range of prices. These batteries are built with extra patented construction features to give maximum power, long life and dependability. They set a new standard of battery performance. Manufactured in Firestone's own battery factories in Akron and Los Angeles.

FIRESTONE COMPLETE LINE OF SPARK PLUGS

Manufactured in Firestone's new spark plug factory. The latest and most modern equipment builds into Firestone Long Life Spark Plugs new patented construction features to meet the exacting requirements of each motor car manufacturer—and to give you efficient, economical performance.

Firestone Spark Plugs have four points of superiority:
1. New improved porcelain. 2. Power seals prevent compression losses. 3. Accurate threading insures a perfect fit. 4. Composition and shape of electrodes provide gap that assures easier starting and longer life.

FIRESTONE AQUAPRUF BRAKE LINING

This new Firestone achievement is the outstanding development of the motor industry.

It is a brake lining that has been scientifically treated to actually give drivers the same smooth, safe, sure brake action in either wet or dry weather.

The lining is made in three frictions to meet requirements of each type of motor car and design of brake.

Firestone Aquapruk Brake Lining in set, drilled and countersunk
**FIRESTONE PRODUCTS**

**FIRESTONE RIMS**

Firestone type R and RI interchangeable truck rims have continuous base and side ring which provide full non-flexing support for the tire, thus assuring longer tire wear.

The new Firestone RP passenger rim with quick detachable side ring offers the most modern improvement in passenger car rims.

**TRUCK**

Firestone Rims are the acknowledged standard of the automobile industry

**PASSEREN**

**FIRESTONE COMPLETE LINE OF ACCESSORIES**

Firestone manufactures and vends a complete line of motoring accessories—Tube Repair Kits; Cure Cut (plastic self-curing rubber for repairing minor injuries); Patching Cement (for tube repair, rubber goods' repairs, artists' use, etc.); Cross Patches; Tire Plugs; Tube Protectors; Tire Changer; Rubber Flaps and Flap Material; Hot Patches; Holdfast Friction Tape; High Test Friction Tape; Radiator Hose; Automobile Cleaner and Polish; Tire Paint; Top Dressing; Touch-Up Enamel; White Sidewall Tire Cleaner; Anti-Freeze; Radiator Cleaner; Radiator Sealfast; Mica; Fan Belts; etc.

**FIRESTONE MECHANICAL GOODS**

Firestone has recently invested several million dollars in research and manufacturing facilities to further expand this division of the company's business. Whatever your needs in special rubber goods, Firestone can give you quality with service.

**FIRESTONE VIBRATION DAMPENER**

Among the latest developments, is the Firestone Vibration Damper. This is a bonded rubber-to-metal product upon which machinery is set, increasing the life, efficiency and smoothness of the machine. This elastic mounting can be used with almost any type of moving machinery. It has received the indorsement of leading engineers as an effective aid to the elimination of vibration and the reduction of machine noises.

**FIRESTONE CUSHION CONNECTORS AND FLEXIBLE COUPLINGS**

Firestone Cushion Connectors—resilient supports used to anchor small motors or machines—eliminate vibration and hum.

Firestone Flexible Couplings smooth out sudden jerks when starting motors and correct any slight misalignment between motor shaft and driven unit. Used for all direct motor driven machines.

*Firestone Vibration Damper*

*Above—Firestone Cushion Connector*

*Below—Firestone Flexible Coupling*
FIRESTONE PRODUCTS

FIRESTONE WRINGER ROLLS

Section of Firestone Wringer Roll shows high quality construction

Supplied to leading washing machine producers in the country. Perfectly bonded seal between metal shaft and rubber roll—chemical and mechanical seal. Long lasting, smooth and flexible rolls assure complete satisfaction.

FIRESTONE MOTOR NECESSITIES

Firestone manufactures a complete line of motoring necessities in its own modern factories. Fan belts are made in both flat type and "V" type constructions to fit popular cars. We are one of the largest manufacturers of friction tape—and Firestone Tape is unexcelled for performance. Firestone Radiator Hose is made to fit all passenger car and commercial vehicle requirements—and to withstand the most severe conditions.

FIRESTONE PRODUCTS

FIRESTONE RUBBER CASTER WHEELS

Modern engineering, scientific design, and efficient production have made Firestone the leading manufacturer in this line. Two types; hard rubber and hard rubber core with soft tread.

Caster Wheels come in all styles and sizes

FIRESTONE ALL-RUBBER GARDEN HOSE AND RUBBER TUBING

Firestone All-Rubber Garden Hose is tested to withstand an internal water pressure of 180 lbs., positively will not kink, and is guaranteed for one season's service. Firestone Rubber Tubing is made in any size, corrugation, flexibility, strength and color, according to customer's own specifications.

FIRESTONE INDUSTRIAL FLOORING

Reinforced by webbed stock molded into rubber for added protection and to give many years of heavy service. Will greatly outlast cement finishes. Large orders can be handled promptly.
FIRESTONE PRODUCTS
FIRESTONE FOOTWEAR

On this page are shown a few of the many Firestone footwear products. Firestone style lines, recognized as leaders everywhere, combine distinctiveness and wearing qualities. The factory at Hudson, Mass., is one of the most efficient in the country.


Firestone
HIGH SPEED TIRES

WORLD RECORDS

For 14 consecutive years Firestone High Speed Tires have been on the winning cars in the 500-mile Indianapolis Race.

THIS MEANS BLOWOUT PROTECTION

For 7 consecutive years they have been on the winning cars in the daring Pike's Peak Climb, where a slip brings death.

THIS MEANS NON-SKID SAFETY AND TRACTION

For 3 consecutive years, they have been on the 131 buses of the Washington, D. C. Railway & Electric Company covering 11,357,810 bus miles without one minute's delay due to tire trouble.

THIS MEANS DEPENDABILITY AND ECONOMY

Firestone High Speed Tires were on the Neiman Motors' Ford V-8 Truck that made a new coast-to-coast record of 67 hours, 45 minutes, 30 seconds actual running time.

THIS MEANS ENDURANCE