

143
RUBBER

**THE MODERN
MIRACLE**



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UNITED STATES RUBBER COMPANY
Printed in U.S.A.



THE United States Rubber Company is proud to have been selected by the Ford Motor Company to participate with it in the 1934 Century of Progress Exposition.

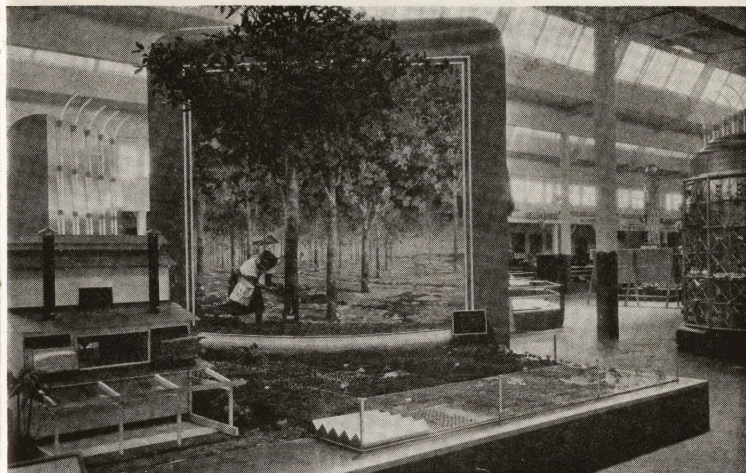
The miracle of rubber is no less startling than the miracle of the modern motor car. Without rubber, motor transportation would not be what it is today. Tires of course are vital, but, in addition, there are hundreds of places in a modern automobile where rubber is used.

I trust that this booklet will help you to a better understanding of rubber, not only in transportation, but as it affects every phase of your life and well-being.

J. B. Davis, Jr.

President,

UNITED STATES RUBBER COMPANY



U. S. Rubber at the Fair

PICTURED above is the United States Rubber Company's Exhibit in the Ford Building, Century of Progress Exposition, Chicago.

In actual demonstration, it shows you how rubber is compounded. It shows you some of the important steps in building U. S. Royal Tires. It presents a number of finished products of the United States Rubber Company. But space did not per-

mit a complete or comprehensive display of the many items in the U. S. line—hence this booklet.

In the following pages you will find an interesting story of rubber, from the tree to the tire—from the virgin latex to the finished U. S. Royal Tires ready for your car.

It will give you some idea of the enormous scope of the United States Rubber Company in rubber growing and rubber manufacturing.



United States Rubber Company

World's Largest Producer of Rubber

World's Greatest

Rubber Plantation



TO obtain better rubber the world's largest producer of rubber carries on agricultural operations on a tremendous scale in far-off Sumatra. It has planted, during the past 25 years, more than twelve

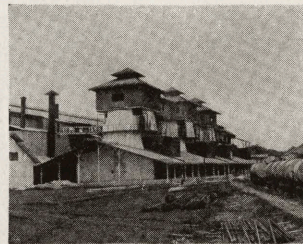
million rubber trees. More than seven million of them are producing latex, the milky substance from which rubber is derived.

In a single row, these rubber trees would more than reach around the earth. And it requires the services of thousands of employees to care for and "milk" these trees in the great U. S. plantations consisting of 135,163 acres, of which nearly 100,000 are planted.



United States Rubber Company

This immense planting operation was accomplished to insure the quality of U. S. Rubber Company products. And as rubber, after all, is really the very life of tires, golf balls, engine mountings and countless other things, you readily can appreciate the importance of a reliable, controlled source of supply.



The benefits of the U. S. Rubber Company's great agricultural developments are unmistakably reflected in the superior quality which distinguishes every one of the thousands of products that carry the trade mark of the United States Rubber Company.



World's Largest Producer of Rubber

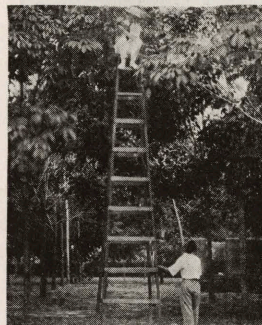


United States Rubber Company

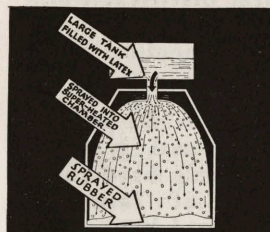
How Rubber is Grown for U.S. PRODUCTS



BUD GRAFTING



POLLINATION



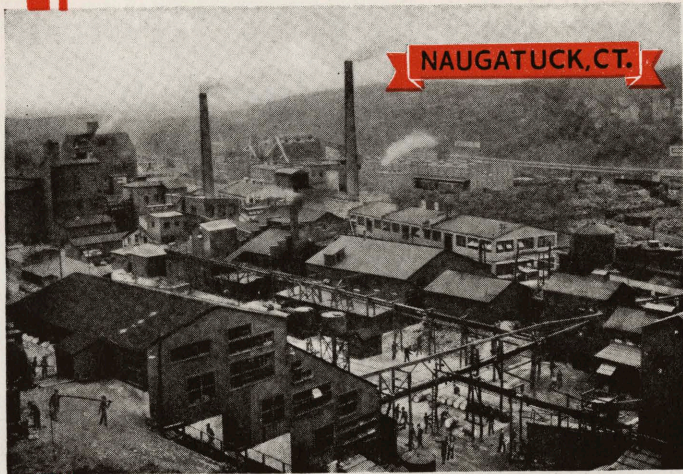
SPRAYED RUBBER

ON the great U. S. plantations even the parentage and characteristics of the trees are under control, due to bud-grafting and artificial pollination. Thus a greater yield per tree is obtained, and latex possessing superior characteristics.

Looking like milk, the latex is collected and taken to the "Spray House" where it is sprayed into super-heated chambers which evaporate the moisture, permitting the pure, minute rubber particles to accumulate in large trays.

Sprayed rubber is the purest form of rubber known. Its development and use are controlled exclusively by U. S. The best rubber naturally makes the best rubber products.

World's Largest Producer of Rubber



BUT even the purest rubber, to attain its greatest usefulness, must be compounded with proper chemicals and minerals and then "cured" or vulcanized by heat. Many of the important chemicals which have helped to make rubber the modern miracle were first discovered and put to use by the United States Rubber Company in its own large chemical plant at Naugatuck, Connecticut.

There most of the progress in rubber chemistry has been made and is being made today. Better chemicals have made possible the development of Tempered Rubber, about which you will read in the following pages. This and other developments



United States Rubber Company

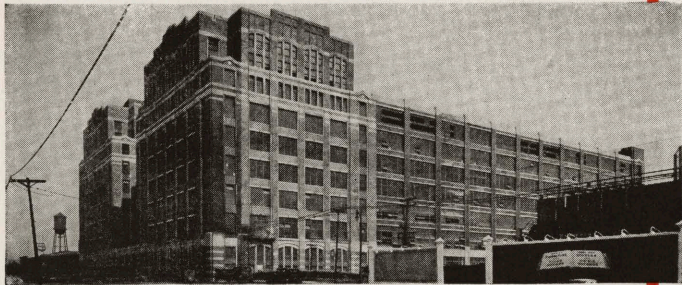


enable U. S. Rubber products to offer longer life, greatest resistance to abrasion and other vital characteristics.

In many rubber products, such as tires, hose and conveyor belts, cotton plays an important part. Cotton cords, for example, are largely responsible for the remarkable blow-out resistance of U. S. Royals. U. S. owns and operates large cotton mills at Hoganville, Ga., Winnsboro, S. C., and Shelbyville, Tenn., where the finest cotton grown is spun into the strongest, longest-lasting cord fabric possible to produce. Consequently, when U. S. combines cotton cords with rubber, it knows that these cords will be worthy of the U. S. product in which they are embodied.

World's Largest Producer of Rubber

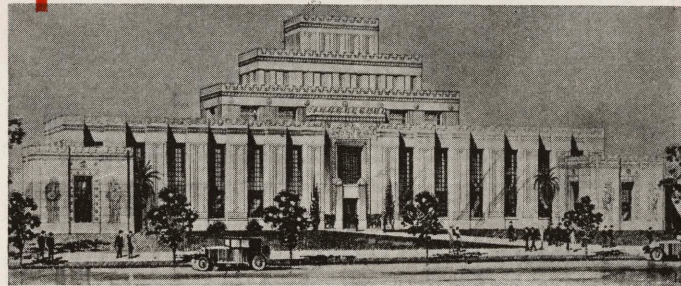
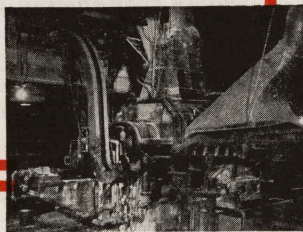
The Building of U. S. ROYAL TIRES



DETROIT, MICH.

In building U. S. Tires the rubber, direct from U. S. plantations, is first compounded with various chemicals, such as sulphur, carbon black, zinc oxide and others, in order to combat heat, light, age, and wear. The rubber, like dough, is worked and "kneaded" in great machines, such as the Banbury Mixer shown here, to accomplish proper distribution of the chemicals.

All of this preparatory work is done at the large U. S. tire fac-

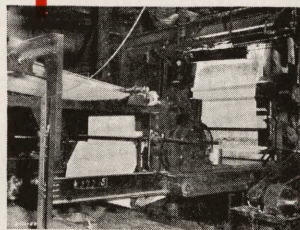


LOS ANGELES, CALIF.

tories at Detroit, Mich., Los Angeles, Cal., and Eau Claire, Wis.

Safety Bonding

The next step is preparing the cords, after they have been spun in the U. S. mills. In all U. S. Tires the cords are "Safety Bonded" by a patented process controlled by the U. S. Rubber Co.

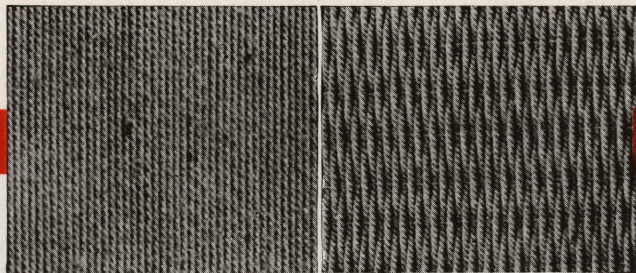


There are no cross threads in U. S. Tires to cause a destructive sawing action.



United States Rubber Company

World's Largest Producer of Rubber



WEB CORD

ORDINARY CORD

Insulated with Live Latex

APPROXIMATELY 12 pounds of live rubber (liquid latex) are added to every 100 pounds of U. S. cord material. The cords are bonded together by this method. The illustration above shows how flat and parallel they lie, without ripple or ridge, as contrasted with ordinary cords. Safety Bonded Web Cords give the greatest strength, generate the least friction and heat.

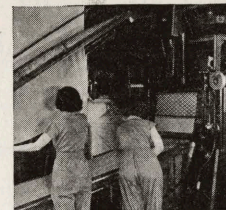
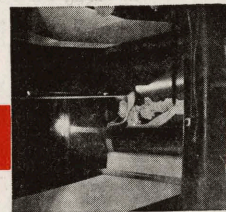
Putting the Tire Together

After the cords have been bonded together they are further insulated by the application of rubber under tremendous pressure. This is known as calendering and forces rubber around and between



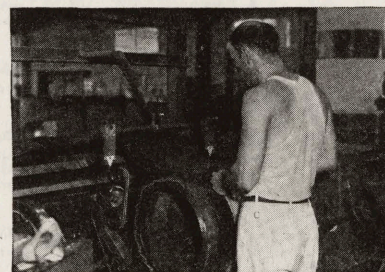
United States Rubber Company

every cotton strand of every individual cord. The rubber-coated cord fabric thus created is then scientifically cut on the bias by a "Ply Cutting" machine, each piece to become a single ply in a U. S. Tire.

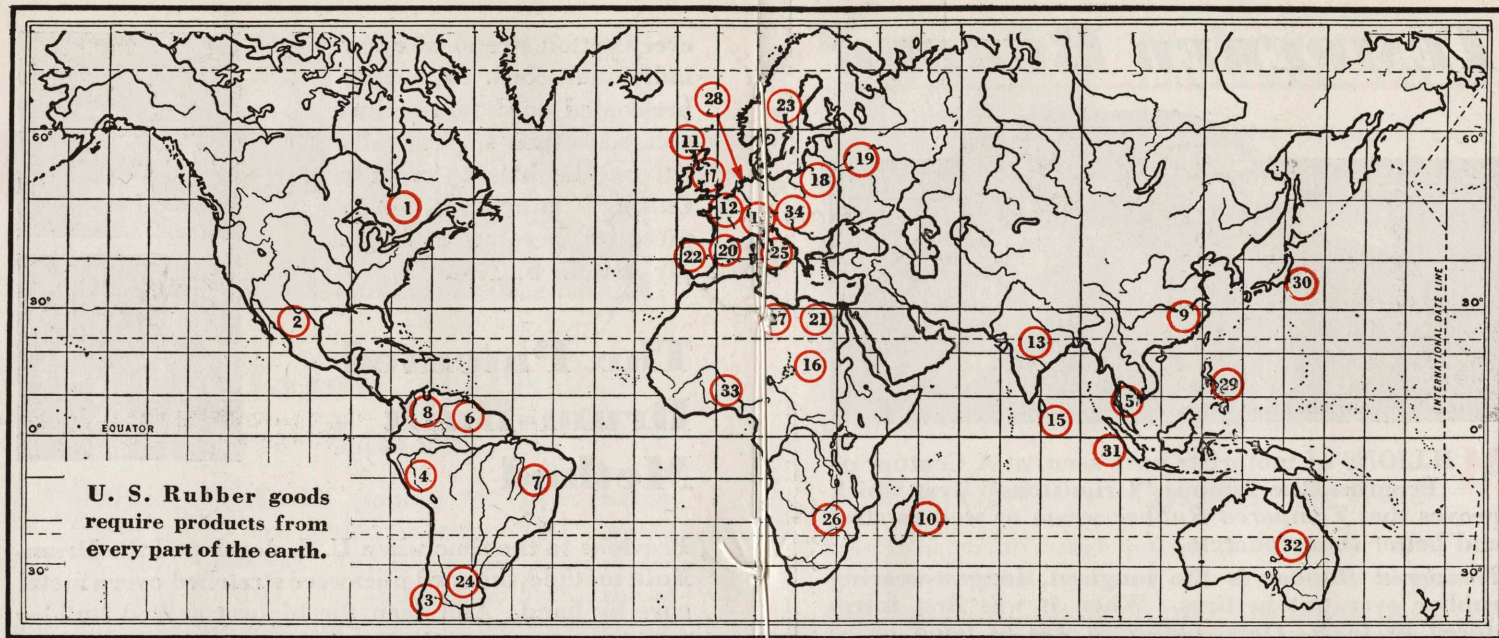


The Patented Drum-Built Method

Previous to the time when U. S. developed the Drum-Built method, the cord plies were stretched over a metal core by hand. And even the highest skilled builder could not stretch all plies uniformly—no two tires were alike. The drum-built method helps to eliminate the human element in tire building and brings a machine-like uniformity and precision to tire construction, overcoming the problems of wrinkling and buckling in the plies.



World's Largest Producer of Rubber



U. S. Rubber goods
require products from
every part of the earth.

1 CANADA
pulp
asbestos

2 MEXICO
fuel oil

3 CHILE
wool
iodine
soap tree bark

4 PERU
cotton

5 MALAYA
rubber
tin

6 VENEZUELA
fuel oil

7 BRAZIL
rubber
balata
carnauba wax

8 COLOMBIA
fuel oil

9 CHINA
antimony

10 MADAGASCAR
graphite

11 SCOTLAND
burlap
linen

12 BELGIUM
flax

13 INDIA
jute
burlap
shellac

14 GERMANY
chemicals

15 CEYLON
rubber

16 SUDAN
gum arabic

17 ENGLAND
fine cotton yarn
chalk

18 POLAND
flax

19 RUSSIA
flax
silk
barytes

20 FRANCE
locust bean gum

21 EGYPT
cotton

22 SPAIN
red oxide of iron

23 SWEDEN
pulp
kraft paper

24 ARGENTINE
wool

25 ITALY
pumice
hemp
talc

26 RHODESIA
asbestos

27 TRIPOLI
abrasives

28 HOLLAND
tapioca

29 PHILIPPINE
ISLANDS
cocoanut oil

30 JAPAN
silk

31 DUTCH EAST INDIES
rubber
gutta percha
lemongrass oil

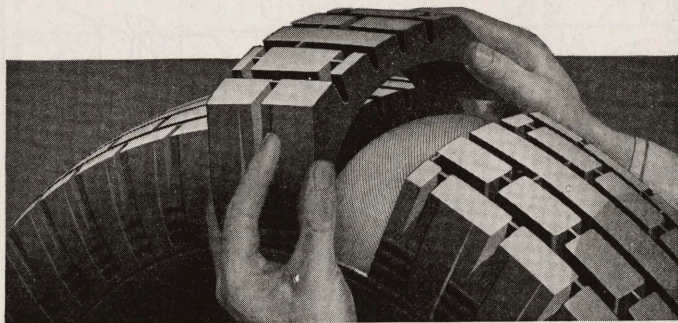
32 AUSTRALIA
wool

33 NIGERIA
palm oil

34 CZECHO-SLOVAKIA
montan wax



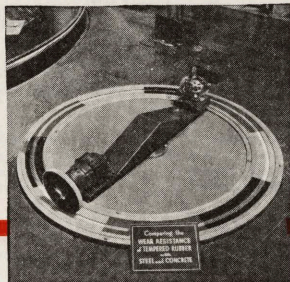
TEMPERED RUBBER



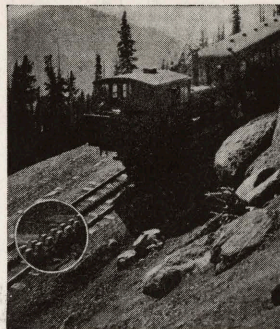
MILLIONS of motorists have seen, at A Century of Progress, the famous "Grindstone" Test which proves that *Tempered Rubber* wears as well as steel and better than concrete.

Tempered Rubber is the toughest, longest-wearing rubber ever put in tires. When it was first introduced in U. S. Tires, before it was as good or as tough as it is today, U. S. Tires immediately began to deliver from 7% to 36% more mileage.

Tempered Rubber is a different kind of rubber, different in manufacture, different in its chemical content. Only U. S. builds tires with *Tempered Rubber*.



United States Rubber Company

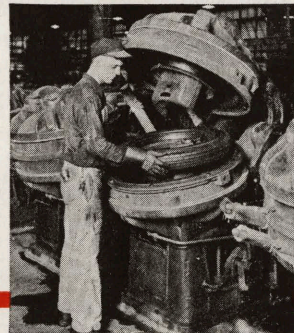


The Famous COG-WHEEL TREAD

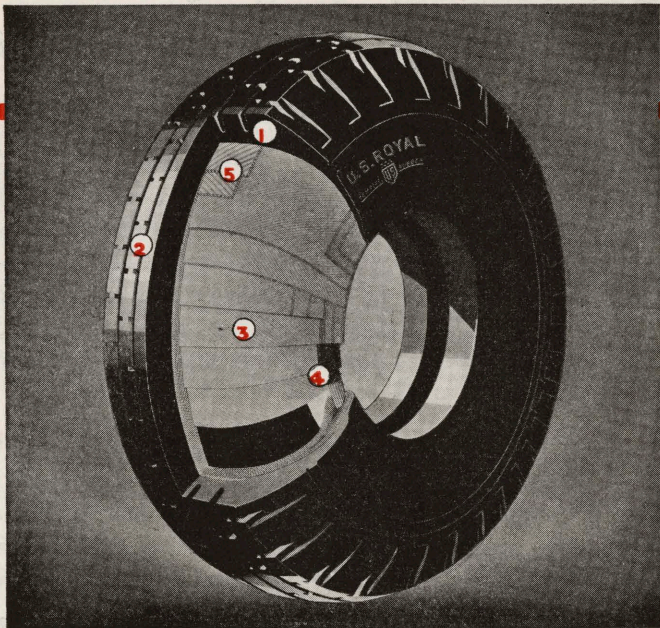
The surest, soundest engineering principle of non-skid safety is embodied in the celebrated Cog-Wheel Tread of U. S. Royals. No other tire has this super-safe, road-gripping tread design — sharp-edged, rugged rubber blocks that bite down through snow or sleet, rain or mud to solid surface.

Watch-Case Curing Method

Like a batch of dough put in the oven to bake, uncured tires must be "cooked" to achieve toughness and durability. Until recently (and even today in some big factories) great stacks of tires were lowered into pits to be cured. U. S., however, uses "Watch Case" molds which automatically cure each individual casing to just the scientifically correct degree.



World's Largest Producer of Rubber



(1) PLUS MILEAGE of *TEMPERED RUBBER*, the toughest, longest wearing tread rubber yet discovered! (2) PLUS SAFETY of the famous Cog-Wheel Tread, the surest non-skid principle known! (3) PLUS CARCASS STRENGTH of the exclusive safety bonding process, the process that welds cords together with live rubber! (4) PLUS BLOW-OUT PROTECTION of the 3-times safer Anchor Bead and (5) PLUS PROTECTION from tread separation of the U. S. Safety Breaker.

AND U. S. TUBES

The carefully engineered features of U. S. Tubes make them perfect running mates for U. S. Tires. Rubber from our plantations, compounded with heat resisting ingredients, patented air vents to guard against trapped air, and rubber valve stems to eliminate leaks all combine to provide a positive safety combination.



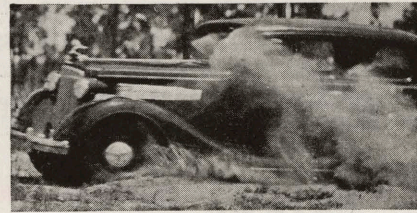
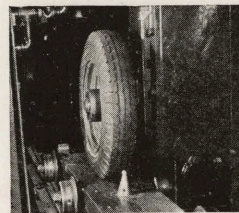
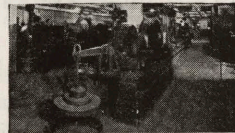
United States Rubber Company

The Most Thoroughly Tested Tire in the World

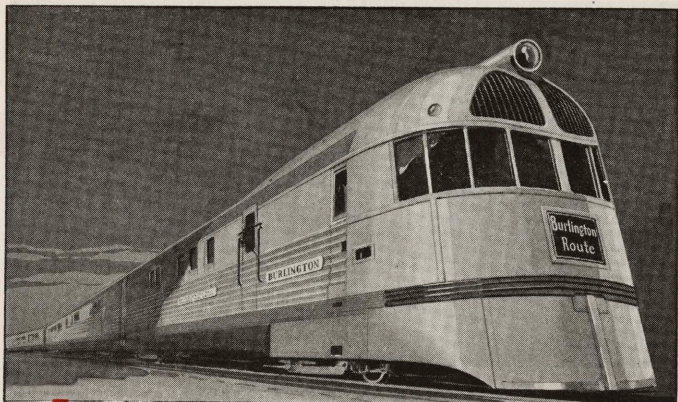
Every batch of rubber, every strand of cotton, every chemical ingredient that goes into a U. S. Royal is subjected to the most minute inspection, the most rigid tests.

And the tire itself is tested—in the laboratory, on every kind of road, on world famous Proving Grounds. On road tests alone, U. S. Royals pile up the staggering total of 60,000,000 miles each year!

No kind of tire torture has yet been invented that is not applied to the U. S. Royal in the U. S. Testing Laboratories—tests for tread wear, tests for ply separation, tests for bead strength, for rupture resistance, for over-heating. It would be impossible for any motorist to put his tires through such brutal punishment. When — and only when — U. S. Royals prove superior to these tests are they considered trustworthy enough to be offered to you, the Motoring Public of America.



World's Largest Producer of Rubber



JUST as in automobile transportation, so in rail transportation, U. S. Rubber engineers have contributed an important part to the cushioning and silencing of modern trains.

The epoch making Burlington "Zephyr"—the equally famous Union Pacific's streamlined "Tomorrow's Train," and the new New York Rapid Transit "El" and subway trains all contain parts manufactured by "U. S."

"U. S." has consistently kept to the forefront in all industrial rubber problems—offering a technical consultation service—great research laboratories, vast manufacturing facilities—and a wealth of experience without parallel in the mechanical rubber goods field.



United States Rubber Company

U.S. MECHANICAL GOODS

The use of rubber in industry has become indispensable . . . from the air hose that drills the blast holes in mine and quarry . . . to huge conveyor belts, nearly every step involves the use of rubber. Rubber is a necessary part of the power generating equipment in mill, mine and factory . . . it transmits that power to where it is needed. Rubber hose is used in conducting every sort of liquid and vapor . . . even solids. Rubber insulation on electric wires and cables is an essential part of the electrical industry. Rubber rolls and blankets in modern printing and lithography are indispensable. Rubber linings in tanks and vats, etc., resist the corrosive action of many chemicals.

"U. S." is particularly proud of the leading part it has played for so many years in developing mechanical rubber goods for industry, in saving money for producer and consumer alike.



World's Largest Producer of Rubber

Builders of Footwear for Ninety Years . . .

1843 is the year when the first vulcanized rubber footwear was made in this country and the U. S. Rubber Company is proud to call attention to the fact that it was *that first maker*. During the last 90 years "U. S." has pioneered every improvement in manufacturing methods. It was the first to leak-test every rubber boot with air pressure under water. It was the first to perfect abrasion tests for soles and heels. Many years ago it started testing its products for wear, toughness and comfort, right on the feet of industrial workers where conditions were artificially severe.



For generations the various styles for particular purposes have been perfected, each to its own particular need. Today the U. S. boots, overshoes, and rubbers are made in different weights with different sole conformations and composition to take care of different demands. Look for the letters "U. S." in the trade mark whenever you are buying heavy rubber footwear. They identify products of the oldest manufacturer in the country.

Today when you put your foot into a U. S. Rubber boot you are really putting it into five boots, so thorough is the reinforcement. In one section, as a matter of fact, there are sixteen different layers of fabric and rubber. There are as many as forty-seven different pieces that are cut, fitted and placed in position by skilled artisans and all welded into one pliable leak-proof structure of uniform toughness by an exclusive vulcanizing method which only United States Rubber Company products enjoy.



United States Rubber Company



Rubber has always been important in the field of wet-weather apparel. With the help of Paris designers and with the enthusiastic approval of leading Paris dressmakers, milliners and boot makers, Gaytees have been developed, year after year, in types which meet every need of costume and convenience. Light, beautiful in texture, admirable in workmanship, Gaytees this year mark the highest point yet reached in overshoe design. There are heel heights to meet any need. In over 10,000 towns and cities in the United States, Gaytees are on sale.

For 17 years the name Keds has identified rubber-soled shoes made by the U. S. Rubber Company. It sets the standard by which all other canvas rubber soled shoes are judged. Light, cool Keds give barefoot freedom without barefoot risk. They permit freedom of action with complete protection from jars and jolts. There are Keds for play and gymnasium use by both boys and girls, special shoes for baseball, basketball, field hockey and handball, and the famous Bike-Keds which are rugged enough for roller-skating.



World's Largest Producer of Rubber

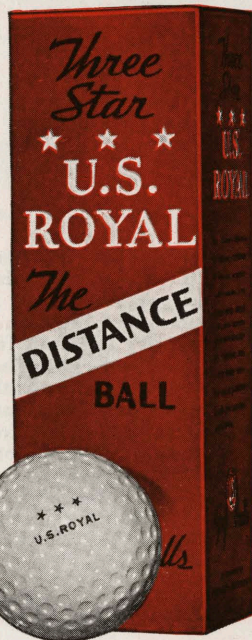
U. S. GOLF BALLS



Four Stages in construction of a U. S. Golf Ball

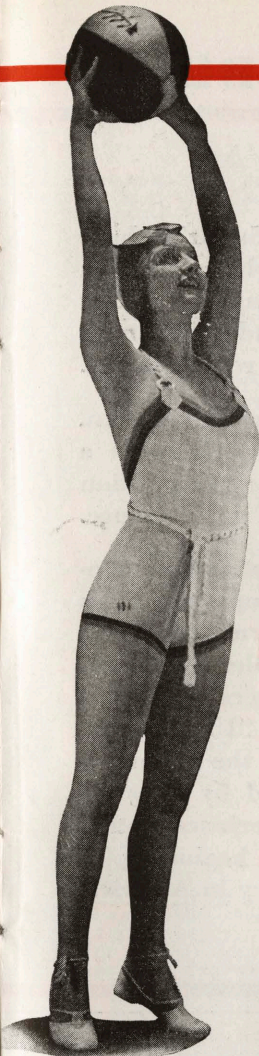
"U. S." makes a fine golf ball to fit every type of player and to suit every purse. To make certain of the highest possible quality "U. S." builds its golf balls *complete*, from core to cover, in one factory—the *only* manufacturer to do so. And "U. S." brings to this activity not only the finest of materials—but seasoned knowledge and special experience gained through years of leadership.

At the head of the line is the famous Three Star U. S. Royal, the longest ball in golf, a thin-cover distance ball with remarkable durability. Identical in quality with the Three Star is the 444 U. S. Royal, the longest *tough* ball built, giving the average golfer all the distance he can possibly get with *any* ball. In the popular-price field "U. S." offers such well-known and widely preferred golf balls as the U. S. Fairway, the U. S. Nobby and the Tiger.



United States Rubber Company

U. S. KREPE-TEX Bathing Suits



WITH bathing caps by "U. S." accepted by discriminating bathers the world over, it was a natural evolution for the United States Rubber Company to pioneer in the field of all-rubber swim suits.

"U. S." Krepe-Tex—a patented fabric-like rubber (made exclusively by United States Rubber Company)—is the perfect material for chic bathing apparel. Produced in beautiful colors that seem alive, "U. S." Krepe-Tex swim suits are seen and admired wherever worn.

At Hollywood, Bar Harbor, Miami, Atlantic City, the Hamptons, along the lake front at Chicago—wherever discerning bathers gather, you will see "U. S." Krepe-Tex swim suits.

"U. S." Krepe-Tex swim suits are hand tailored to flatter the figure. They do not absorb or hold the water. Light in weight, less resistant in the water and actually buoyant, they feel like smooth satin against the skin.

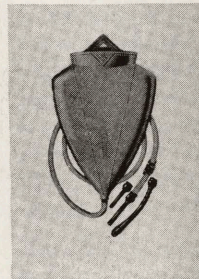
World's Largest Producer of Rubber

U. S. RUBBER SUNDRIES



"U. S." Rubber Sundries have earned an enviable reputation for their unchanging fine quality and absolute dependability under the most exacting requirements.

Beautiful in color and design, they carry to the sick room a note of attractiveness in addition to their promise of performance.



The "U. S." line of rubber sundries is most complete—from rubber gloves to rubber sheets, from hot water bottles to air cushions, from atomizers to folding syringes. Like all "U. S." products, they reflect the manufacturing skill gained by long experience—an experience dating back to the very beginning of the rubber industry in America.



United States Rubber Company

PRODUCTS of the UNITED STATES RUBBER COMPANY

TIRES

- "U. S." Royal, Peerless and Guard Tires.
- "U. S." Royal Heavy Service Tires for Trucks and Busses.
- "U. S." Royal Airplane Tires.
- "U. S." Bicycle Tires.
- "U. S." Royal Heat-Resisting and Peerless Tubes.
- "U. S." Accessories and Repair Material.
- "U. S." Baby Carriage Balloon Tires.
- "U. S." Tractor Tires.

FOOTWEAR

- KEDS, The Shoe of Champions.
- "U. S." Royal Heavy Duty Footwear.
- "U. S." Gaytees Style Overshoes.
- "U. S." Light Rubber Footwear.
- "U. S." Sport Shoes.
- "U. S." Spring-Step Rubber Heels.
- Uskide Soles

HOUSEHOLD GOODS

- "U. S." Hot-Water Bottles, Ice Caps, Rubber Gloves and Rubber Aprons.
- "U. S." Fruit Jar Rubbers.
- "U. S." Baby Coods.
- Tubing and Sheeting.

"LASTEX"

A patented elastic spun yarn which can be knitted or woven into any type of fabric, endowing it with permanent washable elasticity. Practical for all types of textile products and used extensively in corsets, underwear, women's and men's wear, millinery, gloves, surgical and garterless hose, upholstery fabrics and slip covers, linings, footwear, bathing suits, men's accessories such as belts, neckties, shirts and collars and, in fact, in every branch of the textile industry.

SPORTING GOODS

- KEDS Basket Ball and Gymnasium Shoes.
- KEDS Tennis Shoes.
- "U. S." Sportline Fishing Boots, Hunting Boots, Waders and Basket Ball Shoes.
- "U. S." * * * Three-Star Royal, "U. S." 444 Royal, "U. S." Fairway and Nobby Golf Balls.
- "U. S." Bathing Caps and Shoes.
- "U. S." Krep-TeX Rubber Bathing Suits.
- "U. S." Water-Boy Bathing Toys.

CLOTHING

- "U. S." Raynster Raincoats.
- "U. S." Shelters Raincoats.
- "U. S." Waterproof Sport Coats.

INDUSTRIAL GOODS

- "U. S." Packings—Valve, Rod and Sheet, for Steam, Water, Air, Acid, etc.
- "U. S." Belting—Transmission, Elevator and Conveyor.
- "U. S." Hose for All Purposes, Including Air, Fire, Garden, Oil, Steam, Suction, Vacuum, Water.
- "U. S." Rubber Insulated Wire and Cable.
- "U. S." Expansion Joints (Rubber).
- Rubber Tank Linings and Rubber Lined and Covered Pipes and Fittings.
- Hard and Soft Rubber Parts for the Chemical Industry.
- Motor Car Parts—Hard Rubber Steering Wheels, Floor Board and Running Board Mats, Molded Parts, Motor Mountings, Ignition Cable, "U. S." Double Texture Auto Topping, Naugahyde Upholstering Material, etc.
- Molded Goods—Washers, Gaskets, Plumbers' Goods, Mats and Matting, etc.
- Printers' Supplies; Inking Rollers; Offset Blankets; Cutting Rubber; Engravers' Gum.
- Hard Rubber—Battery Jars; Sheet, Rod and Tubing; Pipes and Fittings.
- Rubber Paints (Paravar and Vulcolac).
- Victron—A New Plastic.
- Rubber Coating for Metal.
- Labels for Rubber goods.

RUBBER THREAD

For the manufacture of elastic webbing and golf balls, and for many other purposes.

CHEMICALS

- Heavy Chemicals.
- Chemicals for the Rubber Trade.
- Aromatic Chemicals.

CRUDE AND PROCESSED RUBBER

- Latex Sprayed Rubber.
- Crude Rubber in Sheets.
- Normal Latex.
- Concentrated Latex.
- Latex Compositions (Lotol).
- Artificial Latex (Dispersite).
- Reclaimed Rubber.



A CENTURY OF PROGRESS
FORD EXPOSITION BUILDING
CHICAGO 1934

UNITED STATES RUBBER COMPANY