

POPULAR SCIENCE MONTHLY

Mechanics & Handicraft
NO. U. S. PAT. OFF.

EDITOR:

Perry Githens

MANAGING EDITORS: Fred O. Newman, Volta Torrey

ART EDITOR: Howard C. Jensen

HOME & WORKSHOP EDITOR:
Harry Walton

ASSOCIATE EDITORS: Alden P. Armagnac, Devon Francis,
Robert Gorman, Hartley E. Howe, Herbert Johansen,
Martin Mann, Frank Rowsome, Jr., John F. Stearns,
R. P. Stevenson

WESTERN EDITOR: Andrew R. Boone (Los Angeles, Cal.)

ART DIRECTOR: Harry Samuels

ART ASSOCIATES: Herbert Anthony, Eric Karminski, Jr.,
Stewart Rouse, Frances Cooper (Production)

STAFF PHOTOGRAPHERS: W. W. Morris, Hubert Luckett,
Robert F. Smith

EDITORIAL ASSISTANTS: Mae G. Dyer (Chief), Julia Charnif,
Carol Ennis, Sheldon Gallager, Saverio Rada,
Lillian Thalenfeld, Ruth Westphal

PUBLISHER:

Godfrey Hammond

NOVEMBER 1947

Cover: PSM Kodachrome of actual transmission
by radio of color painting by Ray Pioch

Science News

Boys Build a Cyclotron.....102
Chemicals Grow Crystals.....108
Tune In a Painting.....113
Turbines for Autos?.....128
Steel Muscles Snub Train Bumps.....138
Radar Calls the Weather.....143

Science at Work

Punches Holes in Water..... 86
Mail-Order Isotopes..... 87
Rockets Outgrow Their Desert Range.....120
Six Billion Soft Drinks a Day.....122
Multitude Fed Without Soil.....129
Typewriter Conquers Chinese Symbols.....137
"Plow Proving Grounds" Tests Tools.....144
Jets Are Jacks of Many Trades.....151

(CONTINUED ON PAGE 4)

PSM Features

Picture of the Month..... 81
Potent Push-Up..... 86
Gun Shoots Rail Holes..... 92
How Germans Build Mud Homes..... 93
Big Factories Start Small.....106
Mirror Detects Flaws.....108
Easing Trucker's Burden.....111
Cub Tractor—Toy Version.....112
Printing Photos Inside Glass.....124
Toys and Ideas Fill Rumpus Room.....132
Building a House an Hour.....146
Sodium Carbonate Earns Its Salt.....216

Aviation

Robots Dive into Speed's Mysteries..... 82
Tower Tests Rotors.....100
Trailer Grows Wings.....101
Analyzer Spots Engine Troubles Aloft.....109

Automobiles

Baby Austins Grow Up..... 92
Auto Ideas.....154
Rivetless Brake Linings.....156
Curing Auto-Door Ailments.....158
Gus Spots Double Trouble.....160

Inventions

Climbing to the Rescue.....111
New Ideas from the Inventors.....118
I'd Like to See Them Make.....131
Bricklaying Speeded Up.....142

Photography

Water Power Agitates Tank.....197
Checking the Focus of a Reflex.....197
Homemade Speed Flash.....198
Diffusers Snap On.....202
Attachments for Copying.....203

Mechanics & Shopcraft

Quick-Dry, Odorless Water Paint.....110
Let Your Drill Press Do It.....176
Drill Creates Novel Finishes.....186
Jar Ring Clamps Polishing Pad.....187
Cutter Bevels Irregular Edges.....187

Published monthly at 353 Fourth Avenue, New York 10, N. Y., by Popular Science Publishing Co., Inc. Godfrey Hammond, President and Treasurer; R. C. Wilson, Raymond J. Brown, Stephen P. Glennon, Vice-Presidents; F. W. Briggs, Secretary. Entered as second-class matter Dec. 28, 1918, at the Post Office at New York under the act of March 3, 1879. Additional entry as second-class matter at Dayton, Ohio. Entered as second-class matter at the Post Office in the Department of Canada, 1879. Printed in U. S. A. Copyright, 1947, by Popular Science Publishing Co., Inc. All rights reserved in the United States, Canada, Great Britain, and in all countries participating in the International Copyright Convention and Pan-American Copyright Convention. Yearly subscriptions to United States, its possessions and Canada, \$2.00; foreign countries, \$3.50. Subscribers must notify us of change of address four weeks in advance of the next publication date. Be sure to give both old and new addresses, including zone numbers.

An Invitation to Readers of This Magazine

SEND FOR THIS VALUABLE 512-PAGE ENCYCLOPEDIA VOLUME

—IT'S YOURS FOR ONLY 10¢

WE ARE now on press with our new 1947 Edition of the Funk & Wagnalls New Standard Encyclopedia, which in previous editions sold over 15,000,000 volumes—an amazing record. We have set aside 1,500 sets for readers of this magazine and now invite you to become the owner of a set—making this extraordinary offer to enable you to become acquainted with the volumes before you decide to buy.

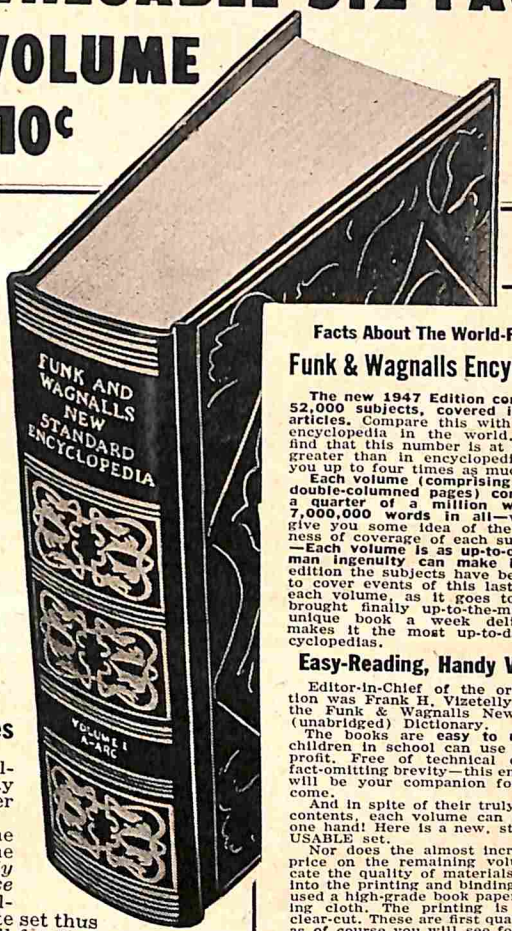
We want to send you Volume I of the set with our compliments. Merely send us 10¢ to cover our mailing cost—more as evidence of your good faith than anything else. This volume is yours to keep without any further reservation on your part. If, after examining Volume I, you want the rest of the 27-volume set, you may receive it at a ridiculously low price through our book a week plan, explained later in this announcement. Or, if you want no further books, you merely drop us a postcard saying so, and that ends the matter.

Book a Week Plan for Balance of Volumes

The first few volumes are now on press. Volume I is delivered to you immediately. Two weeks later, unless you write us saying "No," the next two volumes are mailed to you. Two weeks after that the following two volumes are sent you, and so on. You thus receive your volumes, freshly off press, at the rate of a volume a week. YOU DO NOT PAY FOR ANY BOOKS IN ADVANCE—We enclose a bill

A Choice of Editions

We offer you a choice between our De Luxe and our Library Edition. The De Luxe Edition, at \$1.39 per volume, is bound in dark blue, leather-grained cloth, stamped in red and gilt, as illustrated, with head and tailbands, and harmoniously stained pagetops. Endpapers and frontispieces are color reproductions of woodcuts by Hans Alexander Mueller, the frontispieces being a set of woodcut portraits of American Presidents. The Library Edition costs slightly more (\$1.89 per volume plus the same 11¢



Facts About The World-Famous Funk & Wagnalls Encyclopedia

The new 1947 Edition contains over 52,000 subjects, covered in separate articles. Compare this with any other encyclopedia in the world. You will find that this number is at least 30% greater than in encyclopedias costing you up to four times as much as ours. Each volume (comprising about 500 double-columned pages) contains over a quarter of a million words—over 7,000,000 words in all—which will give you some idea of the completeness of coverage of each subject. Each volume is as up-to-date as human ingenuity can make it. In this edition the subjects have been revised to cover events of this last year, and each volume, as it goes to press, is brought finally up-to-the-minute. Our unique book a week delivery plan makes it the most up-to-date of encyclopedias.

Easy-Reading, Handy Volumes

Editor-in-Chief of the original edition was Frank H. Vizetelly, editor of the Funk & Wagnalls New Standard (unabridged) Dictionary. The books are easy to read! Your children in school can use them with profit. Free of technical detail—and fact-omitting brevity—this encyclopedia will be your companion for years to come. And in spite of their truly enormous contents, each volume can be held in one hand! Here is a new, streamlined, USABLE set. Nor does the almost incredibly low price on the remaining volumes indicate the quality of materials that went into the printing and binding. We have used a high-grade book paper and binding cloth. The printing is crisp and clear-cut. These are first quality books, as of course you will see for yourself.

Copyright 1947, Unicorn Press

UNICORN PRESS, Authorized Publishers Brooklyn 1, New York

I enclose 10¢ in coin or stamps, for which please send me Volume I of the new 1947 Funk & Wagnalls New Standard Encyclopedia in the edition checked below.

DE LUXE LIBRARY

Please also reserve the balance of a set for me in the same edition. If I decide to cancel the reservation after examining Volume I, I will write you saying so, and there will be no further obligation; otherwise you may send me two more volumes every two weeks, and I will pay within 5 days after receiving them, at the rate of \$1.39 per volume plus 11¢ mailing cost for De Luxe Edition (or \$1.89 per volume plus the same handling cost for Library Edition)—that is all!

Volume I is mine to keep in any event.

Name.....
Address.....
City, Zone and State..... 3105

POPULAR SCIENCE

MONTHLY

NOV. 1947
25 CENTS

POPULAR
SCIENCE
MONTHLY

NOV. 1947
25 CENTS

First magazine cover
sent by full-color
radio facsimile.

See p.113

MereMart.com®

Vintage Magazines for Special People

Robots Attack Sonic Riddles
P. 82