



Cleveland, Cincinnati, Chicago & St. Louis: Construction .....338, 698

Code Transmitter: Available for coded wayside and cab signaling application, developed by U. S. & S. Co.....\*572

Coded Track Circuits: For C. T. C. and cab signaling.....\*263 N. Y. C. Installs.....\*249

Collisions: (See Accidents)

Communication: B. & O. tests radio..... 448 Burlington tests radio for train.....\*432 Canadian National tests radio in Montreal terminal area.....\*689 C. B. & Q. uses radio to direct switching.....\*689 C. M. St. P. & P. to test inductive system..... 450 D. & R. G. W. tests radio for train F. C. C. holds hearing on.....\*561 Installed on the Penna.....\*625 On trains on the K. C. S.....\*621 Penna. installs train telephone.....\*152 Railroads add telephone and telegraph facilities.....\*26 Recent tests on L. N. E. R. see train telephones for travelers..... 450 Rock Island tests radio.....\*381 Rock Island to study radio for train..... 272 Santa Fe tests radio on trains.....\*385 Seaboard tests train radio.....\*437 Train telephones on Pennsylvania..... 502 U. S. Military Railway Service in Italy has..... 692

Communications Section, Operating-Transportation Division: New name of Telegraph & Telephone Section, A. A. R..... 580

Concrete Mixer: Small Derrick and, are aid in war time signal work.....\*444

Construction: Signaling, increased in 1943.....\*19

Contact Springs: Reinforcing in electric switch machines.....\*441

Convention in Print: Reports of committees of Signal Section.....\*541

Crank: Improved hand.....\*158

Crossarm Seat: Platform hooked over crossarm.....\*271

Crossover Protection: Communication issued by I.C.C..... 500

Crossovers: Two ways to consider main-line problem.....\*569 Wiring at.....\*570

**D**

Dead-Ends: Tool for winding.....\*160

Denver & Rio Grande Western: Construction.....448, 699 Has longest C. T. C.....\*614 Installs remote control interlocking Signals direct trains at junction on Denver & Salt Lake and.....\*434 Tests radio for train communication.....\*261

Denver & Salt Lake: Signals direct trains at junction on D. & R. G. W. and.....\*434

Derailment: Caused by broken rail on Atlantic Coast Line at Bellbluff, Va..... 46

Derrick: Small, and concrete mixer are aid in war time signal work.....\*444

Draw Bars: For motor car.....\*46

Duluth, Missabe & Iron Range: C. T. C. speeds ore traffic on the.....\*495

**E**

Editorial Comment: A review of 1943.....\*43 Before winter comes.....\*630 Bonding is ever with us.....\*688 Continuity of C. T. C. operation.....\*220 Electronics in signaling.....\*332 How long is a track circuit?.....\*387 Improvements that can be done now.....\*630 Joint inspection of switches.....\*688 Motor car indicators.....\*102 Necessities or frills in C. T. C.....\*332 Railroad applications of electronics.....\*269 Responsibility for train delays.....\*440 Responsibility for train movements with C. T. C.....\*501 Signals as viewed from the cab.....\*387 Track circuits on passing tracks in C. T. C. territory.....\*156 Two ways to consider this main-line crossover problem.....\*569

Electric Interlocking: Military Railway Service in Italy installs.....\*322

Electric Speed-Check: Western Railroad Supply Co. developed timer device.....\*686

Electric Switch Machines: Reinforcing contact springs.....\*441

Electro-Motive Corporation: Construction.....164, 280, 340, 448, 699

Electronic Devices: I. C. announced more intensive study of..... 272

Electronics: A. T. & S. F. to study..... 336 In signaling.....\*332 Railroad applications of.....\*269

Emergency Release: For switch lock..... 157

**F**

Facsimile Machines: Tested on C. R. I. & P. moving train.....\*500

Fairbanks, Morse & Company: Improved motor car.....\*576

Fairmont Railway Motors, Inc.: Draw bars for motor car.....\*46 Manufacturing blade-type axle pulley.....\*160

Federal Communications Commission: Hearings on radio communication.....388, 446 Holds train communication hearing Issued permits to railroads for radio test stations..... 272 Rock Island granted permits for experimental radio stations..... 336

Financial Change: Lee Higginson Corp. purchased all stock of Kerite Insulated Wire & Cable Co., Inc..... 580

Foreign Signaling: Signals in Italy.....\*384

**G**

General Electric Company: Issued bulletin (GEA-4126) describing fundamentals and various applications of electronic control... 106

Great Northern: New interlocking on.....\*363

Green Bay & Western: Construction..... 698

**H**

Hand Crank: Used when testing and adjusting switches on electric interlockings.....\*158

**I**

Illinois Central: Announced more intensive study of electronic devices..... 272 Loud speakers aid yard operation.....\*95

Indicators: Phantom.....\*218

Indicators: Motor car..... 102

Inductive Train Communication: Installed on the Penna.....\*625

Interlocking: Automatic signaling, train stop and route, installed in the Chicago subways.....\*252 Brick cabin moved on the C. & O.....\*333 C. N. installs new type of all-relay, at Montreal.....\*28 D. & R. G. W. installs remote control Installed on G. N. at Hibbing, Minn. Military Railway Service in Italy installs electric.....\*322 New all-relay, at Providence, R. I., on the N. Y. N. H. & H.....\*213 N. Y. C. installs NX, at Utica.....\*38 N. Y. C. modernizes.....\*675

International Great Northern: Construction..... 699

Interstate Commerce Commission: Annual signaling statistics.....\*373 April accident statistics..... 450 Chairman replies to Chairman Wheeler..... 578 Collision between two A. T. & S. F. trains at Hamlet, Colo..... 504 Extends time on K. C. S. block signal installations..... 448 Head-on collision on M-K-T near Eastrop, Texas..... 504 Increased number Bureau of Safety inspectors..... 272 Issued communication on crossover protection..... 500 More safety devices needed..... 578 Preliminary summary of steam railway accidents for June..... 504 Report of 1943 crossing accidents... 450 Report of head-end collision in manual block on Wabash near Galatin, Mo..... 436

Report on head-on collision on U. P. at Willard, Utah.....\*260

Statistics..... 438

Italy: Military Railway Service in.....\*679 Signals in.....\*384

Italy Electric Interlocking: Military railway installs.....\*322

**J**

Joint Inspection of Switches: To obviate train delays.....\*688

**K**

Kansas City Southern: Construction.....280, 448 Installed radio telephone communication..... 504 I. C. C. extends time on block signal installations..... 448 Train communication on the.....\*621

Kato Engineering Company: Issued bulletin explaining in detail their generators..... 640

Kerite Insulated Wire & Cable Company, Inc.: All stock purchased by Lee Higginson Corp..... 580

Kinks: Check circuit for call lamp.....\*334 Chisel shield.....\*158 Crossarm seat.....\*271 Improved hand crank.....\*158 Motor-drive for megger.....\*271 Shunting on infrequently used turn-outs..... 384 Small derrick and concrete mixer are aid in war time signal work.....\*444 Snow scraper.....\*158

**L**

Lee Higginson Corporation: Purchased all stock of Kerite Insulated Wire & Cable Co., Inc..... 580

Letter to Editor: Phantom indications.....\*218 They all love to be waved at..... 502

Lightning Arresters: Designed for use on railway signaling circuits by Westinghouse Electric & Manufacturing Company.....\*573 Westinghouse, for use on signaling circuits.....\*46

Lightning Protection: For signal apparatus.....\*208

Lima Locomotive Works: Construction..... 164

London & North Eastern: Recent tests on, see train telephones for travelers..... 450

Loud-Speakers: Aid yard operation.....\*95

Louisville & Nashville: Construction.....512, 698 Installs C. T. C. on an engine district Troop train derailed near Highcliff, Tenn..... 443

**M**

Main-line Crossovers: Two ways to consider problem.....\*569

Megger Instruments: Motor-drive for.....\*271

Military Railway Service: In Italy.....\*679 Installs electric interlocking in Italy.....\*322 Train communication in Italy..... 692

Minneapolis, St. Paul & Saulte Ste. Marie: Construction..... 581

Missouri-Kansas-Texas: Omission in train order leads to head-on collision..... 504

Missouri Pacific: Construction.....164, 278, 280, 338, 699 Operates by signal indication on 323-mile Arkansas division.....\*193

Morse, Samuel Finley Breeze: Centennial of telegraph in memory of..... 270 Inventor of telegraph.....\*327

Morse Telegraph: Centennial of.....\*327

Motor Cars: Designed for one man by Fairbanks, Morse & Company.....\*576 Drawbars for Fairmont.....\*46 Indicators.....\*102 Making spark plugs last longer.....\*442 Side seats for.....\*334

Motor-Drive: For megger.....\*271

**N**

Nashville, Chattanooga & St. Louis: Construction..... 280

New Devices:  
 Aerial cable for C. T. C. .... \*573  
 Blade-type axle pulley ..... \*160  
 Code transmitter, U. S. & S. Co. .... \*572  
 Draw bars for motor car ..... \*46  
 Electric speed-check ..... \*686  
 Improved motor car ..... \*576  
 Lightning arrester ..... \*46  
 Lightning arresters for signaling circuits ..... \*573  
 New line of rail braces ..... \*574  
 Plug-in relay, U. S. & S. Co. .... \*572  
 Side seats for motor cars ..... \*334  
 Signal relay connector ..... \*634  
 Straight-drive bond head ..... \*576  
 Tool for winding dead-ends ..... \*160

New York Central:  
 Construction ..... 164, 278, 448, 699  
 Installs coded track circuits ..... \*249  
 Installs interlocking at Utica ..... \*38  
 Modernizes an interlocking ..... \*675

New York, Chicago & St. Louis:  
 Construction ..... 222

New York, New Haven & Hartford:  
 Construction ..... 164, 280  
 New all-relay interlocking at Providence, R. I., on the ..... \*213

New York, Ontario & Western:  
 Construction ..... 164

New York Railroad Club:  
 Train communication program ..... 624

Norfolk & Western:  
 Installs C. T. C. on Shenandoah Valley Line ..... \*307

O

Office of Defense Transportation:  
 Work totaling \$135 million approved in 1943 ..... 161

Ohio Brass Company:  
 Awarded Army-Navy "E" ..... 104  
 Straight-drive bond head ..... \*576

"Okocentrol C. T. C. Aerial Cable":  
 For C. T. C. by Okonite Company ..... \*573

Okonite Company:  
 Aerial cable for C. T. C. .... \*573

Ore Traffic:  
 C. T. C. speeds, on the D. M. & I. R. .... \*495

P

Passing Tracks:  
 Track circuits in C. T. C. territory ..... †156

Pennsylvania:  
 Inductive train communication on ..... \*625  
 Installs C. T. C. on 53 miles of busy single track ..... \*423  
 Train telephone communication ..... \*152  
 Train telephones on ..... 502

Pere Marquette:  
 Construction ..... 338, 448

Pettibone Mulliken Corporation:  
 New line of rail braces ..... \*574

Phantom Indications:  
 Letter to editor ..... \*218

Pittsburgh & Lake Erie:  
 Signaling modernized on the ..... \*609

Plug-in Relay:  
 Used for C. T. C. and developed by U. S. & S. Co. .... \*572

Polar Code Control:  
 C. N. installs new type of interlocking at Montreal ..... \*28

Protection:  
 Lightning, for signal apparatus ..... \*208

Pulley:  
 Fairmont blade-type axle ..... \*160

R

Radio:  
 Burlington uses to direct switching Canadian National tests in Montreal area ..... \*689  
 D. & R. G. W. tests, for train communication ..... \*261  
 Rock Island granted permits for experimental radio stations by F. C. C. .... 336  
 Rock Island to study, for train communication ..... 272

Radio Communication:  
 B. & O. tests ..... 448  
 Burlington tests, between yard office and car ..... \*390  
 Burlington tests for train communication ..... \*432  
 Federal Communications Commission hearings on ..... 388, 446  
 K. C. S. installed ..... 504  
 Rock Island tests ..... \*381  
 Santa Fe tests on trains ..... \*385  
 Seaboard tests ..... \*437

Radio Controlled Facsimile Machine:  
 Rock Island demonstrates ..... \*500

Radio Test Stations:  
 Construction permits issued to railroads by Federal Communications Commission ..... 272

Rail Braces:  
 New line of adjustable, by Pettibone Mulliken Corporation ..... \*574

Railway Signaling:  
 Circulation frozen ..... 388  
 Request your index now for past 12 issues ..... 687

Reading:  
 Light-type signals installed on ..... \*90

Reinforcing Contact Springs:  
 Electric switch machine ..... \*441

Relays:  
 Cleaning bearings in ..... \*441

Remote Control:  
 And C.T.C. operation on B. & M. .... \*211  
 Saves train time on Baltimore & Ohio ..... \*665

Remote Control Interlocking:  
 On D. & R. G. W. .... \*318

Request Your Index:  
 For past 12 issues of *Railway Signaling* ..... 687

Review of 1943:  
 Transportation in war ..... †43

Richmond, Fredericksburg & Potomac:  
 Construction ..... 448

Rubber Matting:  
 Substitute for ..... \*571

S

Safety Devices Needed:  
 Statement made by Chairman Wheeler of the Senate committee on Interstate Commerce ..... 578

Safety Legion of America:  
 Grade crossing and trespassing accidents on radio program ..... 504

St. Louis-San Francisco:  
 Installs C. T. C. on 47 miles ..... \*144

St. Louis Southwestern:  
 Construction ..... 338, 390  
 Installs C. T. C. .... \*79

Scraper:  
 Snow ..... \*158

Seaboard Air Line:  
 Construction ..... 512  
 Tests train radio communication ..... \*437

Seats:  
 Crossarm ..... \*271  
 Side, for motor cars ..... \*334

Shield:  
 Chisel ..... \*158

Shunting:  
 On infrequently used turnouts ..... 334

Side Seats:  
 For motor cars ..... \*334

Signal Apparatus:  
 Lightning protection for ..... \*208  
 Plan now for extensive programs ..... \*630  
 Protect before winter comes ..... †630

Signal Construction:  
 Increased in 1943 ..... \*19

Signal Indication:  
 M. P. operates by, on 323-mile Arkansas division ..... \*193

Signaling:  
 A. T. & S. F. installs C. T. C. on 115.6 miles ..... \*668  
 Automatic, train stop and route interlocking installed in the Chicago subways ..... \*252  
 C. P. installs automatic block ..... \*366  
 Canadian Pacific installs C. T. C. .... \*86  
 C. R. I. & P. installs cab signaling and C. T. C. .... \*198  
 Construction increased in 1943 ..... \*19  
 Electronics in ..... †332  
 I. C. C. annual statistics ..... \*373  
 Light-type signals installed on the Reading ..... \*90  
 Make improvements now ..... †630  
 Modernized on the P. & L. E. .... \*609  
 Protect before winter comes ..... †630  
 St. Louis-Southwestern installs C. T. C. .... \*79  
 Small derrick and concrete mixer are aid in war time work ..... \*444

Signal Relay Connector:  
 Designed for changing out relays quickly by Cannon Electric Development Co. .... \*634

Signals:  
 As viewed from the cab ..... †387  
 Direct trains at junction on D. & R. G. W. and D. & S. L. .... \*434  
 In Italy ..... \*384  
 J. W. Lattig, signal inventor, dies ..... \*97  
 Light-type, installed on Reading ..... \*90

Signal Section, A.A.R.:  
 Carries on during war time—Reports of committees ..... \*547  
 Elects officers for 1944 ..... 48  
 Holds meeting in Chicago ..... 161

Snow Scraper:  
 For removing snow from under switch rods ..... \*158

Southern:  
 Construction ..... 338, 698

Southern Pacific:  
 Construction ..... 698

Spark Plugs:  
 Making, last longer ..... \*442

Spokane, Portland & Seattle:  
 Construction ..... 699

Statistics:  
 Annual report of Bureau of Safety ..... 98  
 I. C. C. report of ..... 438  
 I. C. C. report on April accidents ..... 450  
 January accident ..... 222  
 Railroads add telephone and telegraph facilities ..... \*26  
 Signal construction increased in 1943 ..... \*19  
 Signaling, I. C. C. annual ..... \*373

Straight-Drive Bond Head:  
 Announced by Ohio Brass Co. .... \*576

Switches:  
 Joint inspection of ..... †688

Switching:  
 C. B. & Q. uses radio to direct ..... \*689

Switch Lock:  
 Emergency release needed for ..... 157

Switch Machines:  
 Reinforcing contact spring in electric ..... \*441

T

Telegraph:  
 Centennial of Morse ..... 270, \*327  
 Telegraph & Telephone Section, A. A. R.:  
 New name for ..... 580

Telephones:  
 Communication on trains on the K. C. S. .... \*621  
 On Pennsylvania trains ..... 502

Telephone & Telegraph Facilities:  
 Railroads add ..... \*26

Telephone Communication:  
 Penna. installs communication between trains ..... \*152

Terminal Railroad Association of St. Louis:  
 Construction ..... 280

They All Love to be Waved At:  
 Letter to the editor ..... 502

Track Circuits:  
 How long is a ..... †387  
 N. Y. C. installs coded ..... \*249  
 On passing tracks in C. T. C. territory ..... †156

Trade Publications:  
 Kato Engineering Company issued bulletin explaining in detail their generators ..... 640

Traffic:  
 C. T. C. speeds ore, on the D. M. & I. R. .... \*495

Train Communication:  
 B. & O. tests radio ..... 448  
 Burlington tests radio for ..... \*432  
 Canadian National tests radio in Montreal terminal area ..... \*689  
 C. B. & Q. uses radio to direct switching ..... \*689  
 D. & R. G. W. tests radio for ..... \*261  
 F. C. C. holds hearing on ..... \*561  
 Installed on the Penna. .... \*625  
 In U. S. Military Railway Service in Italy ..... 692  
 On the K. C. S. .... \*621  
 Program at New York Railroad Club  
 Recent tests on L. N. E. R. see train telephones for travelers ..... 450  
 Rock Island to study radio for ..... 272  
 Seaboard tests radio ..... \*437  
 Telephones on Pennsylvania ..... 502

Train Delays:  
 Responsibility for ..... †440

Train Movements:  
 Responsibility for, with C. T. C. .... †501

Train Telephone Communication:  
 Pennsylvania installs ..... \*152

Train Time:  
 Remote control on Baltimore & Ohio saves ..... \*665

Trunnion Bearings:  
 Cleaning in relays ..... \*441

Turnouts:  
 Shunting on infrequently used ..... 334

U

Union Pacific:  
 Accident at Devore, Cal. .... \*143  
 Head-on collision at Willard, Utah ..... \*260

Union Switch & Signal Company:  
 Army-Navy "E" Award presented to Construction ..... 164, 581  
 New code transmitter ..... \*572  
 Plug-in relay ..... \*572

U. S. Military Railway Service:  
 (See Military Railway Service) ..... \*679

W

Wabash:  
 Construction ..... 278, 390  
 Head-end collision in manual block near Gallatin, Mo. .... 436

War Production Board:  
 Work totaling \$135 million approved in 1943 ..... 161

War Time Changes:  
 For your magazine ..... 44



Western Railroad Supply Co.: Developed electrical speed-check device .....	*686
Westinghouse Electric & Manufacturing Co.: Lightning arresters for signaling circuits .....	*46, *573

What's the Answer?:	
Emergency release for switch lock.....	157
Making spark plugs last longer.....	*442
Reinforcing contacts .....	*441
Substitute for rubber matting.....	*571
To clean bearings in relays.....	*441
Wiring at crossovers.....	*570

Wiring:	
At crossovers .....	*570
<b>Y</b>	
Yard Operation:	
Loud speakers aid.....	*95

## Quick Reference to Feature Articles

Atchison, Topeka & Santa Fe.....	*385, *668	Chicago Subways .....	*252	New York Central.....	*38, *249, *675
Baltimore & Ohio.....	*665	Denver & Rio Grande Western.....		New York, New Haven & Hartford.....	*213
Boston & Maine.....	*211	.....	*261, *318, *434, *614	Norfolk & Western.....	*307
Canadian National .....	*28, *483	Duluth, Missable & Iron Range.....	*495	Pennsylvania .....	*152, *423, *625
Canadian Pacific .....	*86, *366	Great Northern .....	*363	Pittsburgh & Lake Erie.....	*609
Chesapeake & Ohio.....	*383	Illinois Central .....	*95	Reading .....	*90
Chicago, Burlington & Quincy.....	*432, *680	Kansas City Southern.....	*621	St. Louis-San Francisco.....	*144
Chicago, Rock Island & Pacific.....		Louisville & Nashville.....	*135	St. Louis Southwestern.....	*79
.....	*198, *263, *381, *500	Missouri Pacific .....	*193	Seaboard Air Line.....	*437

## Personal Mention

[Photographs are indicated thus\*. Obituaries are indicated thus†]

Adams, Braman Blanchard.....	†*396	Fohey, O. J. ....	*508	Horsch, W. H. ....	*509
Aitchison, Frank H.....	*50	Foster, Russell C. ....	*694	House, D. R. ....	392
Alford, B. J.....	*338	Frank, A. ....	581	Howard, Carl G. ....	*392
Andrews, Maurice G.....	*274	Frantzen, Oswald .....	*506, †*696	Howard, Leslie Eugene .....	*696
Atwater, J. G., Jr.....	338	French, Orrin C. ....	*694	Howson, Elmer Thomas .....	†*512
Baker, W. R.....	*636	Friedman, J. N. ....	392, *394	Hutchins, John S. ....	*637
Barber, Clyde .....	506	Fuchs, Frederick E. ....	*508	Ivey, S. B. ....	392
Barnes, N. C. ....	104	Furman, B. ....	164	Jacobsen, A. C. ....	394
Barnett, Albert .....	694	Gallagher, J. R. ....	694	Jacobsen, E. R. ....	*637
Becksted, Walter F. ....	48, *161	Gane, S. E. ....	696	Jenne, W. J. ....	396
Behringer, C. J. ....	506	Garrett, H. A. ....	396	Jensen, C. H. ....	*640
Bell, Robert John .....	*48	Gauthier, Joseph Alfred .....	*224	Johnson, John Edgar .....	*581
Beyer, F. E. ....	392	Goodson, A. N. ....	164, 224	Jordan, Walter Mark .....	*452
Black, Harry Lee .....	*161, 274	Goodwin, W. N., Jr. ....	509	Judge, C. P. ....	*696
Bond, Herbert A. ....	*694	Green, A. F. ....	394	Kahn, H. E. ....	278
Bryant, James L. ....	*274	Green, Clayton Horace .....	161	Kearton, Wilfred .....	†*640
Burley, Paul B. ....	*272	Greene, B. S. ....	694	Keers, C. B. ....	694
Carson, Donald V. ....	394, 450	Griffith, R. G. ....	274	Kirsch, J. I. ....	161, *222
Carter, C. B. ....	450	Hakola, Edward .....	278	Koch, Frederick C. ....	*580
Cline, Alexander D. ....	*273	Halsey, W. W. ....	*637	Lamb, Frank X. ....	509, *512
Coles, John R. ....	274, *336	Hamburger, George .....	*512	Lattig, J. William .....	*†97
Constable, Fred W. ....	48, *106	Hammel, H. M. ....	164	Law, J. C. ....	694
Cosey, V. L. ....	392	Hammond, John W. ....	640	Lawrence, R. E. ....	696
Cowherd, George R. ....	396, *506	Hancock, Joseph V. ....	278	Leach, A. B. ....	*394
Crago, Paul H. ....	*698	Hardcastle, Thomas D. ....	450	Lederer, Karl M. ....	509, *512
Crouse, Ira W. ....	*276	Hart, Thomas T. ....	48, *106	LeHew, R. C., Jr. ....	*694
Dahl, Ernest A. ....	*272	Hartley, H. H. ....	274, 276	Leib, F. E. ....	*698
Ditchendorf, C. J. ....	531	Hartzell, William W. ....	104	Lewis, E. H. ....	274
Dueland, R. C. ....	274	Hazlett, E. N. ....	394	Loomis, Harold S. ....	*508
Dunn, Homer W. ....	*336, 392	Heitzman, C. T. ....	581	Lord, E. ....	104
Edwards, R. B. ....	640	Heitzman, T. P. ....	581	McCaleb, D. ....	390
Eimers, J. C. ....	278	Hershberger, M. H. ....	394	McCowan, John .....	104
Elliott, W. H. ....	†*396	Hickey, S. W. ....	*637	McCurry, Raymond A. ....	*274
English, J. M. ....	274	Hinton, K. A. ....	171	McGowan, Bernard F. ....	336
Farsie, N. R. ....	696	Hixson, C. W. ....	450	McKenerly, Harry P. ....	104, *164
Fisher, E. J. ....	164	Hoone, L. J. ....	450	MacGregor, Charles .....	†*278
Fitzgerald, Daniel J. ....	*273	Hoover, James M. ....	*452	Major, T. E. ....	390
Fleming, F. J. ....	278	Hopkins, Harry L. ....	*276	Mann, Evan F. ....	*104

Marak, Charles Thomas .....	104, 161	Porterfield, D. W. ....	274, *276	Stroud, Nels H. ....	*48
Mather, Paul V., Jr. ....	508	Post, Ernest K. ....	*48	Stultz, G. W. ....	274
Maynard, Henry A. ....	*222	Price, W. F. ....	*392	Summers, C. L. ....	390
Maze, James L. ....	394, *506	Quinn, J. J. ....	450	Swartzwelder, A. B. ....	274
Merrick, C. W. ....	*637	Raasch, Roy C. ....	*394	Teifeld, A. R. ....	*394
Miller, A. C. ....	394	Rankin, Donald W. ....	694	Thomas, L. R. ....	336
Miller, A. J. ....	*696	Rathje, V. F. ....	508	Thomson, C. A. ....	*580
Miller, D. C. ....	394, 506	Rice, Arthur H. ....	*580	Thompson, C. A. ....	396
Miller, John H. ....	*509	Ritterbush, Leonard C. ....	508, *509	Tocher, Charles E. ....	*104
Miller, John S. ....	512, *698	Robison, Charles K. ....	*274	Uhr, S. L. ....	390
Morrisey, J. ....	581	Sage, W. E. ....	394	Varner, R. H. ....	392
Murphy, F. J. ....	164	Sampson, F. F. ....	452	Varner, W. J. ....	581
Murphy, R. H. ....	581	Schmidt, M. H. ....	508	Walker, Charles G. ....	450, *506
Myers, Charles R. ....	*276	Selquist, Rolf ....	698	Ward, Dan ....	392, *394
Nelson, C. ....	581	Sheffer, H. H. ....	396	Watt, M. R. ....	394
Niedeck, J. A. ....	581	Shepard, A. L. ....	276	Weatherby, H. ....	161
O'Brien, George E. ....	48, *106	Smeltzer, V. O. ....	*392	Webb, John A. ....	48, 106
O'Brien, L. B. ....	450	Smith, B. F. ....	694	Webb, W. L. ....	640
Oliphant, L. Ward ....	*392	Snodderly, L. E. ....	694	Wickerham, William W. ....	*273
Orcutt, Daniel P. ....	*452	Sowards, Clyde C. ....	*696	Wilson, A. W. ....	164
Peacock, Maurice, Jr. ....	272	Sparks, John W. ....	580, *636, 694	Wood, Richard H. ....	508, *509
Pearson, W. J. ....	394	Spicer, Clifford ....	274, *338	Woodfill, C. C. ....	390
Peney, H. J. ....	581	Spillman, R. M. ....	104	Yerger, J. F. ....	581
Peterson, E. P. ....	274	Steiner, D. H. ....	274	Yessen, Clarence W. ....	394, *508
Pittenger, C. A. ....	581	Steiner, H. K. ....	274	Zimmerman, Frank O. ....	696
Pitts, R. B. ....	506	Stiebeling, Henry G. ....	*276		
Pontius, Frank ....	278	Stonehouse, M. M. ....	50		

## Index to Authors

[Illustrated articles are indicated thus\*]

Anderson, E. W. ....	157	Hillig, J. E. ....	*441	Smith, J. W. ....	*571
Ash, Philip P. ....	157	Hoffman, J. H. ....	*158, *271	Smith, Malcolm ....	*218
Beall, C. R. ....	*570	Houser, J. E. ....	*388	Sosnowski, P. R. ....	*271, *441
Craig, J. H. ....	*158	Muller, J. P. ....	*547	Stuart, F. C. ....	334
DePriest, J. R. ....	*487	Opsahl, A. M. ....	*208	Triem, W. R. ....	*152
Elsworth, R. B. ....	*38	Pulham, W. W. ....	*261	Ward, James ....	*158
Ely, E. H. ....	*334	Reich, E. W. ....	*90	Wescott, G. R. ....	*442
Finzi, L. A. ....	*208	Schmidt, H. P. ....	*268	Zane, W. F. ....	*680
Grondahl, Dr. L. O. ....	*625				

