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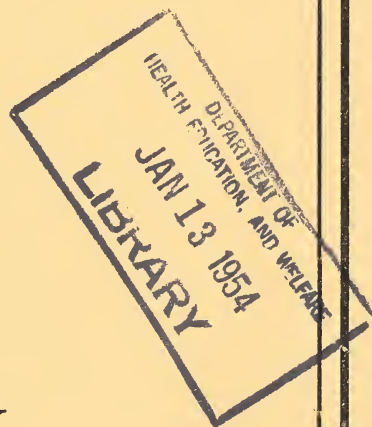
# AMERICAN JOURNAL *of* PHYSICS

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## Foreword

IN order that the *American Journal of Physics* may be used effectively, an index covering more than one year at a time is necessary. It is even more necessary than it would be in the case of a journal of similar size in which much original research was reported, for the reason that developments in teaching do not follow as simple or as easily remembered a chronological pattern as developments in research.

Grateful acknowledgment to the National Science Foundation, which defrayed approximately 60 percent of the total cost of production of this index, is hereby made by the American Association of Physics Teachers and by other subscribers to the *Journal*. The balance of the cost was borne by the American Association of Physics Teachers itself.

The majority of the work required in the preparation of this 20-year cumulative index fell on the

shoulders of Dr. B. H. Dickinson, Assistant Editor of the *American Journal of Physics*, who spent the equivalent of many months on the task. In organization and in typing, he was generously aided by Mrs. Dora Murphy, who recently concluded a three-year period of valuable service as secretary to the Editor of the *American Journal of Physics*. She, in turn, was assisted in the mechanical details by Miss Nancy Heuer and Miss Jane Turner.

All these individuals join the Editor in the hope that this 20-year index will serve its purpose in making the volumes of the *Journal* much more useful to their owners than they have been in the past.

THOMAS H. OSGOOD  
*Editor*

July 6, 1953  
East Lansing, Michigan

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## How to Use This Index

THIS Cumulative Index is intended to provide ready reference to all material published in the *American Journal of Physics* in Volumes 1 (1933) to 20 (1952). Since the system of indexing the early volumes differed from that used for later ones, a completely new index has been prepared. By its use the searcher should be able to locate the name of any contributor to the *Journal* or the title of his contribution.

The Index is subdivided into two parts: an Author Index listing the names of the contributors of papers, notes, letters, book reviews, and abstracts of addresses; and an Analytical Subject Index listing the titles of papers, notes, letters, book reviews, addresses, and digests of periodical literature. The Author Index lists the names of contributors alphabetically; the Analytical Subject Index lists the titles of contributions according to a Classification of Subjects to be found on page 2 of this Index. Since most papers and addresses

can be classified under more than one of the categories listed, multiple listing of the titles has been employed in preference to a system of cross references, with the expectation that the Analytical Subject Index will be easier and quicker to use.

Location of the original contribution to the *Journal* may be made by use of the volume, page, and year-of-publication numbers following each item in the order indicated. Thus a listing, 17: 324—1949, signifies Volume 17, page 324, year 1949. In the case of an abstract of a paper or address, the Letter (A) follows the page number; similarly the letter (L) denotes a Letter to the Editor and the letter (T) designates an item published only by title. Contributions to the Regular Section and the Notes and Discussion Section of the *Journal* are not specially designated. The form in which Book Reviews are listed is such that their nature is immediately apparent.

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## Analytical Subject Index

THE Analytical Subject Index lists the titles of articles, notes, letters, book reviews, abstracts, and addresses published in the *American Journal of Physics* in Volumes 1 (1933) to 20 (1952), together with the names of authors and co-authors. Titles of contributions are listed according to a Classification of Subjects to be found on page 2 of this Index. In preference to using a system of cross references, multiple listing of titles has been employed in the belief that it will be easier to find a particular title when it is included under each of several categories under which it might reasonably be indexed.

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- Two new wave models, Harold K. Schilling. **15**: 197(A)—1947
- Vibrating rods as laboratory sources of sound, E. H. Johnson. **8**: 265(A)—1940

- Visual sonometer for student use, Carl E. Howe. **5**: 46(T)—1937
- Wave machine and a device for compounding two simple harmonic motions, H. W. Farwell. **7**: 406—1939

*Electrical*

- Absolute ampere current balance for laboratory use, H. V. Neher. **20**: 358—1952
- A.c. operated photoelectric relay, J. J. Coop. **6**: 334—1938
- A.c. voltage supply for spectrum tubes, E. H. Green, K. H. Fried, and W. H. Mais. **8**: 197—1940
- Alternating-current stroboscope, Grant O. Gale. **7**: 415—1939
- Attachment for wall galvanometer telescope holder, Willard H. Eller. **7**: 198—1939
- Automatic chart plotter for lecture room demonstrations, Alfred O. Nier and R. B. Thorness. **19**: 416—1951
- Capacitance operated relay, David Bailey. **8**: 265(A)—1940
- Charge-discharge key and timer, Willard H. Eller. **3**: 188—1935
- Convenient projection electroscope, John J. Heilemann. **2**: 28—1934
- Current balance, F. W. Warburton. **4**: 50(T)—1936
- Current doubler, F. B. Pauls. **15**: 360(T)—1947
- Cyclotron model, E. E. Grassel. **12**: 53(A)—1944
- Demonstrating a.c.-d.c. voltage relationships, simple apparatus for, Leo Seren; **16**: 449—1948
- Demonstrating an induced electromotive force, new apparatus for, Hermann Haemmerle. **17**: 317—1949
- Demonstrating and mapping an electric field, apparatus for, Rev. B. Brinker. **18**: 318(T)—1950
- Demonstration potentiometer, P. Bender, **15**: 435(A)—1947
- Design of an apparatus for cathode sputtering, James A. Darbyshire. **1**: 90(A)—1933
- Device for rapid and automatic recording of electrostatic fields, Albert D. Ehrenfried. **12**: 371—1944
- Double ionization chamber for electrometers, Carl T. Hibdon. **11**: 234(T), 286—1943
- Double purpose brackets for a d'Arsonval galvanometer, I. A. Balinkin. **3**: 132—1935
- Driver for the Calthrop resonance pendulum, Paul F. Bartunek. **18**: 521(A)—1950; **19**: 57—1951
- Electric arc welder for the small shop, Clyde A. Crowley. **1**: 124(A)—1933
- Electric circuit analysis boards, C. R. Fountain. **4**: 132—1936
- Electric field-mapping apparatus, C. J. Overbeck. **16**: 123(A), 186—1948
- Electric wiring and apparatus board, J. T. Peters. **7**: 137—1939
- Electrical analog computers, solution of differential equations by, Joseph L. Ryerson. **19**: 90—1951
- Electrolysis and synthesis of water and the photosynthesis of HCl, apparatus for, J. G. Black. **1**: 55(T), 119—1933
- Electrolytic cells, Merle Randall. **7**: 292—1939

- Electrostatic bubble gun for demonstrating deflection of charged particles, L. P. Delsasso. **15**: 360(T)—1947
- Electrostatic pendulum, J. A. Van den Akker. **3**: 72—1935
- Electrostatic voltmeter, Milton Y. Warner. **2**: 75—1934
- Elementary experiment on the potentiometer, auxiliary apparatus for, Sanford C. Gladden. **5**: 134—1937
- Experiments with a unipolar generator and motor, R. J. Stephenson. **5**: 108—1937
- Fractional-volt cell, W. James Lyons. **7**: 136—1939
- Frank-Hertz experiment, tube for, Robert Hofstadter. **10**: 112—1942
- Foolproof Geissler tube holder, Donald P. LeGalley. **6**: 214—1938
- Glow tube flasher for demonstrating condenser properties, V. Wouk. **13**: 415—1945
- High-frequency electromechanical filters, C. R. Mingins, S. Bartnoff, and L. A. Howard. **20**: 395(T)—1952
- High-frequency induction furnace and high-frequency, high voltage induction coil, James L. Winget and Frank M. Durbin. **9**: 291—1941
- How to make thermocouples. **1**: 91(A)—1933
- Impedance bridge, a.c. operated, Everett Thompson. **8**: 265(A)—1940
- Improved apparatus for demonstrating an oscillatory discharge, Edwin S. Fox. **19**: 486(A)—1951
- Induction kilowatt-hour meter, Grant O. Gale. **18**: 388—1950
- Inexpensive high resistance voltmeter, Orrin H. Smith. **19**: 244—1951
- Ionization chamber, calibration of, Duis D. Bolinger. **19**: 397(T)—1951
- Lauritsen quartz fiber electroscope, student experiments with, G. Karioris. **19**: 398(T)—1951
- Light-weight transformers for aircraft, D. W. Grant. **1**: 59(A)—1933
- Mapping electrical fields, simple apparatus for, C. J. Overbeck. **16**: 123(A)—1948
- Measuring temperature coefficients of resistance, adjustable constant temperature oven for, F. C. Walz, R. V. Cartwright, and W. B. Pietenpol. **5**: 221(A)—1937
- Mechanical switching arrangement for oscillograph demonstrations of certain electric transients, L. E. Smith, Jr. **9**: 50—1941
- Modified Cotton balance, Zaboj V. Harvalik. **19**: 128—1951
- Motor-driven vibrator units for the measurement of capacitance, D. S. Ainslie. **19**: 486(A)—1951; **20**: 52—1952
- Motors from magnets, Myron A. Jeppesen and Clement R. Field. **12**: 173—1944
- Photoelectric cells, photometric teaching methods using, U. Andrewes and T. J. Dillon. **19**: 514—1951
- Photoelectric liquid-level controller, C. Ireland. **15**: 92(T)—1947
- Projection electroscope, Wilfrid J. Jackson. **3**: 193—1935
- Resistivity apparatus for rod specimens, A. A. Hammond and C. Williamson. **14**: 70(T)—1946
- Rotatable stand and switch for Crookes tubes, W. F. Powers and G. W. Alderman. **4**: 32—1936
- Scanning device for plotting equipotential lines, John Simpson. **8**: 326(A)—1940
- Sensitivity control for the Lindemann electrometer, L. G. Grimmett. **1**: 27(A)—1933
- Simple cell for the study of conductance, H. B. Gordon. **1**: 124(A)—1933
- Simple high impedance a.c. voltmeter, P. H. Miller, Jr., and L. I. Schiff. **12**: 173—1944
- Simplified direct-reading potentiometer, A. H. Weber. **9**: 314—1941
- Some remarks on the galvanometer, M. S. Cohen. **16**: 324(T), 365(T)—1948
- Special commutator for the comparison of capacitances, D. S. Ainslie. **6**: 325—1938
- Stepped-surface piezoelectric filters, R. R. McDonough, D. W. MacLeod, and G. A. Larson. **20**: 395(T)—1952
- Stroboscope for the demonstration of phase differences in alternating current circuits, E. Hobart Collins. **11**: 38—1943
- Stroude and Oates induction bridge, W. H. Hyslop. **19**: 483(T)—1951
- Ten channel time sequential analyzer, F. C. Whitmore, P. R. Liller, and H. Fenny. **19**: 442(A)—1951
- Tesla coil, James B. Kelley and Lee Dunbar, Sr. **20**: 32—1952
- Three-phase motor and generator attachment, Gregg M. Evans. **3**: 76—1935
- Use of polystyrene to improve electrostatic equipment, A. R. Reed. **17**: 391(A)—1949
- Van de Graaff generator for demonstration purposes, Richard H. Waters. **19**: 195(T)—1951
- Variable carbon resistance, A. G. Fruehan and C. L. Mehl. **2**: 123(A)—1934
- Variable low resistance, W. H. Walton. **6**: 224(A)—1938
- Weston standard cell, D. S. Dedrick. **11**: 171(T)—1943

#### *Electronic*

- Amplifiers for cathode-ray oscilloscopes, Howard Voluum. **18**: 525(T)—1950
- Application of a thyratron to induction coils, L. C. Verman. **3**: 141(A)—1935
- Circuit details for a small supersonic oscillator of the piezoelectric type, Walter C. Bosch and Walter G. Allée, Jr. **6**: 272—1938
- Combining of simple electronic instruments into a Z meter and its use in studying characteristics of radio equipment, O. L. Railsback. **17**: 93(T), 232(A)—1949
- Compact thyratron demonstration apparatus, T. A. Benham. **12**: 166—1944
- Compensating audio pre-amplifier, A. W. Nye and P. L. Bateman. **8**: 325(A)—1940
- Constructing a simple magnetic lens electron microscope, Charles W. Hoffman. **8**: 70(A)—1940
- Construction of an electron multiplier tube, J. J. Brady. **8**: 139(T)—1940

- Course in electronics, laboratory equipment for, K. S. Kion. 15: 161—1947
- Designation of a thyratron tube, Carl C. Sartain. 19: 389(L)—1951
- Dissecting the cathode-ray oscilloscope, Rose A. Carney and John J. Spokas. 20: 326(A)—1952
- Double-bulb neon oscillograph, James F. Koehler. 4: 202—1936
- Double oscilloscope, William Hurst. 5: 213—1937
- Double wave device for use with a cathode-ray oscillograph, I. B. Davidson. 3: 46(A)—1935
- Electronic diffraction analyzer, K. R. Symon. 19: 400(T)—1951
- Electronic magnifier for observation of infra-red and ultraviolet, Zaboj V. Harvalik. 18: 151—1950
- Electronic spark timing device, A. Bardócz and A. Kemény. 20: 244—1952
- Electronic switch in experiments, O. L. Railsback. 15: 92(T)—1947
- Electronic voltage regulator for a small direct-current generator, G. G. Kretschmar. 8: 327(A)—1940; 9: 126—1941
- Electronics teaching aid, R. W. Leonard. 14: 276(T)—1946
- Elementary laboratory apparatus for instruction in the principles of radio, Sanford C. Gladden. 6: 167(A)—1938
- Improved electron projection microscope, Frank Grundhauser. 19: 251(T)—1951
- Inexpensive thermionic voltmeter, T. B. Rymer. 10: 61(A)—1942
- Medium-voltage regulated d.c. power supply, Austin R. Frey. 9: 242—1941
- Multiple frequency standard employing a modulated television-type raster for comparison of frequencies, Thomas J. Yeadon and Lloyd W. Morris. 19: 444(A)—1951
- New short-wave electronic tubes, J. J. Livingood. 15: 433(T)—1947
- Oscillatory discharge, improved apparatus for demonstrating, Edwin S. Fox. 19: 486(T)—1951
- Radio units for the laboratory, Paul A. Northrop. 7: 42—1939
- Simple high frequency demonstration oscillator, Richard H. Howe. 20: 465(A)—1952
- Simple 1000-c/sec oscillator, A. P. Marion. 16: 60(A)—1948
- Square-wave generator for instructional use, E. H. Green and W. H. Mais. 15: 171—1947
- Suggested equipment for teaching elementary electronics, R. Stollberg. 15: 360(T)—1947
- Triode model for use in the electrolytic tank, C. Williamson and E. M. Pugh. 9: 244(T)—1941
- Two-tube direct current amplifier, D. Brumbaugh. 9: 244(T)—1941
- Type of equipment useful in teaching electronics, Robert Stollberg. 15: 193—1947
- Vacuum tube electrometer for student use, Robert O. Bock. 18: 523(T)—1950
- Vacuum-tube voltmeter with an electric eye, Dale C. Baker. 8: 265(A)—1940
- Various applications of the multiplier photocell, L. D. Fallon. 18: 318(T)—1950

*General*

- Adjustable curve, H. H. Macey. 8: 78(A)—1940
- Adjustable support and stand for Bunsen burner, I. A. Balinkin. 4: 219(A)—1936
- Affectometer (lie detector), J. C. Kyle. 11: 171(T)—1943
- Appliance for exhibiting Brownian movement, Louis E. James and W. James Lyons. 2: 25—1934
- Blackboard harmonograph, John J. Heilemann. 3: 44(T)—1935
- Blast lamp from Bunsen burner, Ross A. Baker. 2: 38(A)—1934
- Calcite crystal model, F. E. Christensen. 18: 161—1950
- Capillary mercurial barometer, C. V. Boys. 11: 172(A)—1943
- Concrete bases for retort stands, O. H. F. Pieris. 6: 224(A)—1938
- Convenient viscosity apparatus, G. P. Brewington. 16: 319—1948
- Crystal models made on a milling machine, Allan Chace and H. Kersten. 6: 215—1938
- Demonstration apparatus for Lissajous figures, Paul F. Gaehr. 9: 94—1941
- Demonstration barometer, H. W. LeSourd. 14: 213(A)—1946
- Demonstration mass spectrometer, F. E. Christensen. 19: 59—1951
- Demonstration of Steiner's theorem, model for, James T. Curtis. 15: 93—1947
- Demonstration water hammer made of metal, Harold K. Schilling and Henry L. Yeagley. 12: 230, 239(T)—1944
- Density plummets, C. E. Lloyd. 13: 59(A)—1945
- Device for measuring the contour of the surface of a rotating liquid, Will C. Baker. 2: 26—1934
- Dynamic atom model, John B. Underwood. 16: 410—1948
- Easily constructed tangent meter, Robert M. Hoffman. 3: 46(A)—1935
- Filling large closed-end manometers, apparatus for, Angus E. Cameron. 2: 38(A)—1934
- Flexible crystal models, Isay A. Balinkin. 4: 50(T)—1936
- Genesis of flight instruments, M. F. Bates. 1: 61(A)—1933
- Glycerol vapor vacuum pump, Paul Alexander. 17: 47(A)—1949
- Improved Young's modulus apparatus, George H. Olewin. 8: 396—1940
- Industrial instruments, Philip Ewald. 11: 170(A)—1943
- Inexpensive Millikan oil-drop apparatus, C. C. Kiplinger. 4: 88—1936
- Instructional apparatus for studying pipe flow, R. C. Binder. 12: 41—1944



- Introduction to the elementary theory of linear servo-mechanisms, L. Jackson Laslett. **16**: 260—1948
- Kukulograph, M. J. Hoferer. **1**: 56(A)—1933
- Making a small compressor, Orlin D. Trapp. **2**: 39(A)—1934
- Mass-spectrograph and its uses, Walker Bleakney. **4**: 12, 31—1936
- Mechanical model for the demonstration of the Franck-Condon principle, Peter Pringsheim. **14**: 112—1946
- Metal crystal goniometer, Joseph W. Hickman and Joseph Getkso. **18**: 233—1950
- Model of the structure of Rochelle salt, Frances Pleasonton. **12**: 19—1944
- Model seismographs, R. W. Stott. **11**: 236(A)—1943
- Model to demonstrate elastic and plastic properties, G. Goldfinger and C. B. Wendell, Jr. **13**: 58(A)—1945
- New type of viscosimeter, A. A. Elkarim. **16**: 489—1948
- Osmosis, apparatus for demonstrating, H. D. Smith. **19**: 400(T)—1951
- Performance of a high precision spherometer, Wayne Steimle and L. E. Dodd. **9**: 245(A)—1941
- Projection manometer, J. W. Moore and C. M. Furgason. **11**: 115(A)—1943
- Radium-water generators, Herman Schlundt. **1**: 59(A)—1933
- Safety device for a differential oil manometer, W. Barkas. **7**: 350(A)—1939
- Seismograph, electromagnetic type, S. J. Allen. **16**: 324(T), 365(T)—1948
- Servomechanisms, Ralph Hoyt Bacon. **16**: 79—1948
- Simple apparatus for surface tension measurements, W. E. Haskell. **5**: 96(A)—1937
- Simple cathetometer and appliances, C. J. Overbeck. **3**: 34—1935
- Simple centroider, P. L. Taulbee. **13**: 57(A)—1945
- Some servo-mechanism principles, T. A. Benham. **18**: 334(A)—1950
- Stroboscopic aids in the teaching of physics, Newell S. Gingrich. **5**: 277—1937
- Supersonic wind tunnels, G. L. Shue. **16**: 324(T)—1948
- Surface tension apparatus, photometer, and torque board design, C. J. Overbeck. **4**: 35—1936
- Two-fluid barometer; linear expansion apparatus with special pump for circulating water; two types of apparatus for measuring thermal conductivity, C. Williamson. **13**: 265(T)—1945
- Two simple pieces of apparatus for the general physics course: a refractometer and practice switchboard, J. Bradford. **18**: 430(T)—1950
- Two useful laboratory devices: a falling-body release and a specific-resistance frame, C. R. Smith. **15**: 92(T)—1947
- Tyndall cone apparatus, H. J. Abrahams and H. J. Dubner. **11**: 77(A)—1943
- Apparatus for demonstrations, T. M. Hahn. **5**: 285(T)—1937
- Apparatus wanted and for sale, O. Blackwood. **19**: 384(L)—1951
- Building physics equipment, J. R. Watson. **8**: 139(T)—1940
- Choice and design of educational apparatus for the general physics laboratory, W. L. Kennon. **4**: 50(A)—1936
- Classroom and laboratory wind tunnels, design and performance of, J. C. Herman, B. V. Rhodes, and M. S. McCay. **19**: 443(A)—1951
- Concerning articles on apparatus for demonstration and experiment, C. W. Ufford. **7**: 260—1939
- Direct applications of physics laboratory equipment on aircraft, Sherwood Githens, Jr. **10**: 212(A)—1942
- Historic demonstrations, O. Oldenberg. **20**: 111—1952
- Historical apparatus at the University of Mississippi, W. L. Kennon and Sanford C. Gladden. **6**: 1—1938
- Improvements in laboratory apparatus, E. H. Collins. **11**: 171(T)—1943
- Improvements in two standard pieces of apparatus, John L. Gipprich and Alfred H. Weber. **4**: 133—1936
- Inexpensive laboratory manual rack, A. C. Adams. **1**: 123(A)—1933
- Laboratory apparatus for high schools, W. L. Woodson. **7**: 201(T)—1939
- Large-sized apparatus in lecture demonstrations in physics, W. H. Kadesch. **19**: 483(T)—1951
- Method of handling elementary laboratory apparatus, Sanford C. Gladden. **5**: 283—1937
- Modern instrumentation needed at the undergraduate level, M. E. Hufford. **19**: 399(T)—1951
- New developments in apparatus for the elementary laboratory, O. H. Blackwood and E. Hutchisson. **1**: 41—1933
- Nonpriority equipment, R. C. Hitchcock. **10**: 211(T)—1942
- On the choice, design and construction of apparatus for large laboratory classes, W. L. Kennon. **16**: 362(T)—1948
- Poggendorff's apparatus, W. Weniger. **14**: 70(T)—1946
- Simple apparatus in teaching and research. **13**: 58(A)—1945
- Some apparatus for elementary laboratories, Thomas H. Osgood. **4**: 51(T)—1936
- Some new and improved physics apparatus, J. G. Black. **3**: 44(T)—1935
- Some physics laboratory devices, Newton Gaines. **4**: 51(A)—1936
- Some simple, large scale models of apparatus developed for first-year college physics, J. Barton Hoag. **12**: 18(T)—1944
- Some useful demonstration apparatus, N. H. Black. **7**: 426(A)—1939
- Some uses of surplus equipment, A. D. Hummell. **19**: 196(T)—1951
- Student contributions to the physics laboratory, F. Buckley. **11**: 155; Erratum. **11**: 271—1943

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Adequate physics apparatus for every school, Shailer Peterson. **11**: 358(A)—1943

- Student projects in the physics shop, G. P. Brewington. 7: 71(A)—1939  
 Surplus war equipment in the local area, W. Geer and D. L. Soltau. 14: 70(T)—1946  
 Three pieces of equipment for the museum or demonstration laboratory, J. G. Black. 8: 71(A)—1940  
 Three pieces of lecture room apparatus, demonstration of, Richard M. Sutton. 5: 45(A)—1937  
 Wind tunnel for student experiments and for demonstrations, I. F. Zartman and Warren Eberly. 9: 84—1941

#### *Light Sources*

- Cold cathode mercury arc, Paul L. Copeland. 18: 462(T)—1950  
 Construction of a standard lamp, R. Hanau. 17: 164(T)—1949  
 Convenient mercury-vapor lamp, R. R. Ramsey. 5: 87—1937  
 Exciting the spectrum of atomic hydrogen, apparatus for, Myron A. Jeppesen. 5: 225—1937  
 Flame source for spectroscopy, K. D. Larsen and W. Keck. 20: 309—1952  
 High intensity mercury vapor lamp, use of, Winthrop R. Wright. 5: 229—1937  
 Inexpensive strong U-V source, Fred W. Decker. 19: 251(A)—1951  
 Mercury light source, Wallace A. Hilton. 19: 248(L)—1951; O. K. Hudson. 20: 114(L)—1952  
 Mercury light source for use with a diffraction grating, Milton L. Braun. 20: 311(L)—1952  
 Mercury spectrum source, M. W. Schwinn. 15: 279; Paul Kirkpatrick. 15: 359—1947  
 Mercury spectrum source for the basic laboratory, M. S. McCay and E. S. Bishop. 16: 361(A)—1948  
 New point-source lamp for the laboratory, Harry L. Smith. 14: 313—1946  
 Simply constructed source of ultraviolet continuum, Stanley S. Ballard and Martin E. Nelson. 8: 167—1940  
 Source for the Balmer series of hydrogen and deuterium, G. P. Harnwell. 3: 185—1935

#### *Magnetic*

- Control unit for experiments on hysteresis loops and magnetization curves, Willard H. Eller. 8: 234—1940  
 Demonstration unit for magnetostriction, Jun Hino and George Sandoz. 18: 515—1950  
 Design and construction of an air-cooled electromagnet, Arthur Luck. 18: 392(T)—1950  
 Dynamic hysteresis loop tracer, T. A. Benham. 19: 136(T)—1951  
 Experiments with an electromagnetic pendulum, J. E. Calthrop. 3: 32—1935  
 Laboratory type of traction electromagnet, Sanford C. Gladden. 4: 134—1936  
 Magnetic force-finder, Ludvig C. Larson. 1: 116—1933  
 Magnetic heat-motor, John Mills. 5: 40—1937  
 Measuring attraction between magnetic poles, apparatus for, G. E. Davis. 8: 264(T)—1940

- Measuring the force exerted on a magnet by a linear direct current, apparatus for, Alva Turner. 17: 76—1949  
 Model of ferromagnetic action, R. M. Bozorth and J. F. Dillinger. 5: 157—1937  
 Models to illustrate gyromagnetic and electron-inertia effects, S. J. Barnett. 5: 1—1937  
 New type of search coil for ballistic measurement of magnetic field strength, John Simpson. 8: 327(A)—1940  
 Null-deflection magnetometer with electromagnetic control, A. R. Ingles. 16: 391—1948  
 Pendulum, magnetically maintained, Harold P. Knauss and Paul R. Zinsel. 19: 318—1951  
 Simple balance for measuring electromagnetic attractions and repulsions, R. M. Archer. 3: 198(A)—1935  
 Small electromagnet, S. R. Williams, W. W. Stiffler, and T. Soller. 1: 26(A)—1933  
 Useful search coils and systems for uniform magnetic fields, Milan W. Garrett. 19: 136(T)—1951

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- Airplane model to show forces, Blaine E. Sites. 12: 171—1944  
 Approximate supersonic wind-tunnel simulator, Allen H. Schooley. 15: 164—1947  
 Atwood's machine and the teaching of Newton's second law, Irving L. Kofsky. 19: 354—1951  
 Atwood's machine from Behr apparatus, P. W. Williams. 18: 237(L)—1950  
 Bicycle ergometer, Lester I. Bockstahler. 17: 232(A)—1949  
 Centrifugal force and rotational inertia, apparatus for study and use in general physics laboratory, W. L. Kennon. 19: 443(A)—1951  
 Centripetal force apparatus, E. H. Collins. 14: 70(T)—1946  
 Closed differential pulley, Laurence E. Dodd. 19: 399(A)—1951  
 Convenient vibration source of variable frequency for Melde's experiment, Peter I. Wold and Frank J. Studer. 8: 165—1940  
 Demonstration gyroscope, V. E. Eaton. 18: 334(A)—1950  
 Demonstration of Lissajous' figures, G. E. F. Fertel and R. W. B. Stephens. 5: 223—1937  
 Demonstration with a pressure-gauge tester, B. L. Brinker and A. P. Brinker. 14: 341(T)—1946  
 Determining the mass of a body without the aid of gravity, apparatus for, Henry A. Erikson. 6: 33—1938  
 Device for demonstrating constancy of angular momentum, Mason E. Hufford. 13: 417—1945  
 Device to assist in height measurements, S. L. Anderson. 11: 172(A)—1943  
 Device to show constancy of angular momentum in rotation, M. E. Hufford. 13: 56(T)—1945  
 Experiment illustrating centripetal force, Park Hays Miller, Jr. 12: 40—1944  
 Falling body apparatus, Alton Wangsgard. 6: 205—1938

- Force in an elevator cable, T. H. Stevens. **7**: 136—1939
- Forced vibration demonstration apparatus with stroboscopic attachment, J. Lloyd Bohn and Francis H. Nadig. **9**: 57(A)—1941
- Free-fall apparatus which uses photographic recording, Glenn F. Rouse. **4**: 209—1936
- Freely rotating suspension made from magnet and ball bearings, W. H. Dowland. **9**: 197(A)—1941
- Gravimeter, D. H. Clewell. **10**: 57(T)—1942
- High speed rotors, J. W. Beams. **17**: 391(T)—1949
- Impact ball apparatus, some interesting aspects of, Seville Chapman. **9**: 357—1941
- Improved centripetal force device, Oswald Blackwood. **20**: 400(A)—1952
- Inertia balance for the lecture room, William Schriever. **5**: 48(T)—1937
- Isochronous pendulums: a correction, W. W. Sleator. **16**: 323—1948
- Jet-propulsion apparatus, W. L. McRary and E. L. Bickerdike. **13**: 420—1945
- Laboratory apparatus for the determination of the acceleration of a freely falling body, R. M. Bowie. **1**: 26(A)—1933
- Laboratory experiment leading to the postulation of Newton's laws of motion, apparatus for, Nicholas M. Smith, Jr. **8**: 71(A)—1940
- Larger gyroscope, George P. Unseld. **14**: 274—1946
- Mackay's model of the climbing monkey, W. W. Sleator. **16**: 320—1948
- Measuring the acceleration due to gravity, apparatus for, Julius H. Taylor. **19**: 245—1951
- Measuring torque, apparatus for, W. N. St. Peter. **13**: 265(T)—1945
- Mechanical model for the climbing monkey problem, R. Stuart Mackay. **16**: 248—1948
- Mechanical oscillator for determining moments of inertia, W. C. Elmore. **8**: 394—1940
- Mechanical oscillator for Melde's experiment, P. I. Wold and Frank J. Studer. **8**: 70(A)—1940
- Mechanical stroboscope, Paul D. Bales and Edgar Blackburn. **5**: 39—1937
- Melde experiment, Wallace A. Hilton. **20**: 310(L)—1952
- Modification of the vibration source for Melde's experiment, George D. Rock and Albert May. **9**: 189—1941
- Modified Atwood machine for use by elementary students, K. H. Fried and W. H. Mais. **12**: 210—1944
- Modified ballistic pendulum, W. H. Michener. **9**: 58(A)—1941
- Moment of inertia equipment, C. H. Robertson. **15**: 360(T)—1947
- New impact apparatus, Harold K. Schilling and Henry Yeagley. **15**: 60—1947
- New inertia balance and operational definition of mass, William Schriever. **5**: 202—1937
- New laws of motion apparatus, Harold K. Schilling and David Eickhoff. **2**: 124(A)—1934
- New type "collisions" apparatus, H. K. Schilling. **11**: 47(A)—1943
- Pendulums with clamped or loose hangers, John Satterly. **14**: 316—1946
- Projection apparatus for compounding harmonic vibrations, R. M. Archer. **6**: 109(A)—1938
- Projection centrifuge, Henry A. Erikson. **6**: 39—1938
- Proof of the centrifugal force formula,  $mv^2/r$ , apparatus for, W. H. Dowland and N. Herbert. **9**: 197(A)—1941
- Rocket-propelled airplane, demonstration of, Vernon L. Bollman. **19**: 195(A)—1951
- Rotating cylinder viscometer, simple arrangement for, F. H. Hibberd. **20**: 134—1952
- Simple laboratory apparatus for experiments in dynamics, Walter Soller. **3**: 133—1935
- Simple torque apparatus, R. G. Wilson. **9**: 123—1941
- Stability of centripetal force apparatus, Mildred Allen. **15**: 470—1947
- Study of a new arresting device for Fletcher's acceleration apparatus, W. G. Wadey. **20**: 122—1952
- Transverse-wave apparatus, F. E. Christensen. **16**: 122(A), 248—1948
- Vee pulleys, G. R. Myers. **1**: 90(A)—1933

#### *Nuclear*

- AEC looks at the problem of supplying nuclear reactors for engineering colleges, T. Keith Glennan. **20**: 526(T)—1952
- BF<sub>3</sub> counter, demonstration of, Dale Marvin Holm. **19**: 397(A)—1951
- Classroom demonstration of alpha-particle scintillations, Arthur Waltner. **16**: 44—1948
- Conductivity crystal counters, A. G. Chynoweth. **20**: 218—1952
- Construction and study of the characteristics of Geiger-Mueller counters, G. S. Hurst. **17**: 164(T)—1949
- Easily constructed alpha-particle range apparatus, Vernon L. Bollman. **20**: 374—1952
- Easily constructed apparatus for the measurement of the range of alpha particles in air, V. L. Bollman. **16**: 57(T)—1948
- Fast coincidence analyzer, Charles C. Rayburn and T. M. Hahn, Jr. **19**: 400(T)—1951
- Geiger counter for weak radiations, Robert B. Bennett. **18**: 391(A)—1950
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- Geiger-Müller counters and associated circuits, experiments with, A. L. Hughes. **7**: 271—1939
- Horizontal projection cloud chamber, J. R. Dunning and Edith Haggstrom. **5**: 274—1937
- Hydrodynamic model for demonstrations in radioactivity, J. Lloyd Bohn and Francis H. Nadig. **6**: 320—1938
- Liquid scintillation counters, C. E. Falk and H. L. Poss. **20**: 429—1952
- Magnetic lens beta-ray spectrograph of new design, E. G. Ebbighausen. **16**: 325(T)—1948
- Modified Wilson cloud chamber, George C. Patterson. **19**: 251(T)—1951



- New developments in instruments for courting and detecting nuclear particles, Walter Jordan. **15**: 361(T)—1947
- Particle counters, Robert Walker. **19**: 399(T)—1951
- Photomultiplier tubes as scintillation counters, T. Scolman and R. R. Palmer. **18**: 430(T)—1950
- Physical model to demonstrate nuclear and paramagnetic resonance, E. F. Carr and C. Kikuchi. **19**: 486(A)—1951; **20**: 110—1952
- Projection cloud chamber, M. Stanley Livingston. **4**: 33—1936
- Projection electroscope for  $\alpha$ - and  $\beta$ -rays, B. A. Spicer. **7**: 77(A)—1939
- Proportional counter, investigation of gas amplification in, J. E. Hopson. **19**: 250(A)—1951
- Radioactivity measurements in the undergraduate laboratory, apparatus for, Ralph A. Loring. **20**: 325(T)—1952
- Scintillation counters, Philip A. Goldberg. **16**: 413(A)—1948
- Simplified cloud chamber for the physics laboratory, Elmer Nussbaum. **20**: 466(A)—1952
- Solenoidal beta-ray spectrometer for the undergraduate laboratory, Byron T. Wright. **20**: 194(A), 230—1952
- Solid boron neutron detector, design and construction of, Dale M. Holm. **19**: 483(T)—1951
- Student type portable Geiger-Müller counter, Walter C. Bosch. **5**: 273—1937
- Student's neutron spectrometer, W. C. Koehler and C. C. Harris. **20**: 393(A)—1952
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- Wilson cloud chamber, R. W. Willmott. **16**: 324(T), 365(T)—1948; F. E. Christensen. **18**: 149—1950
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- Automatic polariscope, J. B. Nathanson. **5**: 269—1937
- Balanced-beam, drift-eliminated recording microphotometer, A. H. Budlong. **19**: 398(T)—1951
- C. V. Boys' rainbow cup, H. M. Sullivan. **20**: 184(L)—1952
- C. V. Boys' rainbow cup and experiment with thin films, John Satterly. **19**: 448—1951
- Coarse diffraction gratings for lecture demonstration and laboratory, H. M. Reese and N. S. Gingrich. **14**: 324—1946
- Color demonstration apparatus, J. A. Van den Akker. **16**: 1—1948
- Color mixers, John Zeleny. **4**: 100—1936
- Construction of a recording comparator microphotometer, R. J. Reithel, B. D. Kern, and Richard Hanau. **20**: 388(A)—1952
- Continuously variable diaphragm for use in spherical aberration studies, W. P. Gilbert. **4**: 212—1936
- Convenient apparatus for the diffraction grating experiment, G. P. Brewington. **17**: 580—1949
- Convenient virtual image locator for elementary optics, Paul K. Taylor. **13**: 167—1945
- Demonstrations in geometrical optics, apparatus for, K. H. Fried, E. H. Green, and W. H. Mais. **8**: 43—1940
- Device for teaching thin lenses, R. C. Hitchcock. **12**: 241(T)—1944
- Diffraction of light by supersonic waves in liquids; apparatus for demonstration and for an intermediate laboratory experiment, Alva W. Smith and Lewis M. Ewing. **8**: 57—1940
- Displacement polarimeter, Newton Underwood. **7**: 57—1939
- Dynamic ray tracer for thin lenses and spherical mirrors, Henry A. Knoll. **20**: 390(A)—1952
- Easily constructed Fresnel mirrors, H. M. Reese. **4**: 215—1936
- Elliptic mirror for lecture demonstration, J. Smithson and W. T. Fenhagen. **19**: 442(T)—1951
- Improved apparatus for the study of the concave mirror, J. G. Moorhead. **1**: 113—1933
- Indicating lantern slide color mixer, John J. Heilemann. **4**: 50(T), 211—1936
- Individual apparatus for elementary optics, Eric M. Rogers. **9**: 55(A)—1941
- Inexpensive student interferometer, Francis H. Nadig and J. Lloyd Bohn. **11**: 234(T), 297—1943
- Laboratory modification of the Pulfrich refractometer, V. N. Thatte. **1**: 90(A)—1933
- Large working model of the eye, W. N. St. Peter. **13**: 265(T)—1945
- Lecture-room optical disk, H. E. Carr, W. T. Fenhagen, and J. R. Smithson. **18**: 393(T)—1950
- Lucite accessories for the Stevens optical disk, C. C. Sartain. **9**: 194(A)—1941
- Luminous bridge, W. B. Pietenpol. **10**: 56(A)—1942
- Luminous potentiometer, W. B. Pietenpol. **9**: 55(A)—1941
- Measurement of the index of refraction of air, simple apparatus for, Paul S. Delaup. **14**: 383—1946
- Mechanical device for exhibiting the properties of a thin lens, Ira M. Freeman. **10**: 150—1942
- Mechanical model for demonstrating Fermat's principle, W. Cullen Moore. **18**: 333(A)—1950; **19**: 1—1951
- Model showing variable astigmatism—a modification of Gardner's model, Eric Rogers. **9**: 49(A)—1941
- Model to demonstrate spherical aberration of a concave spherical mirror, F. R. Hirsh, Jr. **13**: 267—1945
- Model to demonstrate the refraction of light at a boundary between two media of different indices of refraction, F. R. Hirsh, Jr. **16**: 57(T)—1948
- Model to show the perfect focusing of a parabolic mirror, F. R. Hirsh, Jr. **14**: 446—1946
- New design for a nodal slide, Leonard Eisner. **20**: 519—1952
- New design of optical bench for lecture and laboratory. F. H. Crawford. **18**: 228(A)—1950
- Nodal slide of flexible design for a course in intermediate optics, Leonard Eisner. **18**: 333(A)—1950
- Optical levers, B. H. C. Mathews. **8**: 270(A)—1940
- Phonoptic equipment for individual student use, Harold K. Schilling. **7**: 70(A)—1939

- Polarization photometer for measurement of low intensity light, R. E. Nyswander. **5**: 220(A)—1937
- Rangefinder using the eyes as objectives, Harley J. Haden. **18**: 165(T)—1950; Harley J. Haden and William H. Morgan. **17**: 73—1949
- Recent developments in the detection of infra-red radiation, R. T. Eliickson. **15**: 199—1947
- Schmidt-type telescope, Carl K. Seyfret. **15**: 362(A)—1947
- Short radius optical lever for use with Young's modulus apparatus, Willard H. Eller. **19**: 379—1951
- Simple color patch apparatus, Robert Weale, **17**: 89—1949
- Simple substitute for a micrometer eyepiece, H. E. Watson. **2**: 38(A)—1934
- Student interferometer, Andrew Longacre. **8**: 38—1940
- Telescope and microscope, basic principle for, H. C. Schepler and A. N. Smith. **19**: 129—1951
- Telescope of very wide field of view and small diameter-to-length ratio, James A. Duncan. **8**: 69(A)—1940
- Tricolor mixing device using small-angle prisms, Calvin C. Warfield. **6**: 167(T)—1938
- Water prisms and a ray-tracing device for demonstrations in optics, Ting Supao. **16**: 52—1948
- Wave-motion slide rule, J. D. Richards. **20**: 305, 325(A)—1952

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- Bellows for homemade enlarging cameras. **1**: 124(A)—1933
- Easily constructed camera for use in making lantern slides, Forrest F. Cleveland. **5**: 226—1937
- Focusing aid for photographic enlarging and other applications of focusing without a ground glass, Albert V. Baez. **20**: 592(L)—1952
- Lens for a miniature camera. I. Clyde Cornog. **13**: 41—1945
- Negative drier. **1**: 124(A)—1933
- Phototube-controlled slave flashgun, H. F. Osterman, R. W. Ashbee, and C. Williamson. **18**: 525(A)—1950
- Projector for stereoscopic pictures, D. Jerome Fisher. **10**: 46—1942
- Rapid photo-printer for small shops, H. C. Karloske. **1**: 57(A)—1933
- Semi-automatic film-slide projector, John A. Eldridge. **6**: 45(A)—1938
- Simple device for rapid production of photographic copies, Forrest F. Cleveland. **8**: 261—1940

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- Absorption cells for vacuum spectroscopy, Robert H. Noble. **17**: 93(A)—1949
- Accessories for portable spectroscopes and spectrometers used in undergraduate instruction, A. N. Lucian. **1**: 21(T)—1933
- Apparatus for spectroscopic analysis, E. E. Chandler. **7**: 77(A)—1939
- Construction of a diffraction grating spectrograph, R. L. Purbrick. **20**: 394(A)—1952
- Grating spectrograph, W. S. von Arx. **11**: 52(A)—1943

- Inexpensive three-meter diffraction grating spectrograph, George Bjorke. **18**: 525(A)—1950
- Laboratory-built spectrographs, lenses for, Ralph A. Loring. **19**: 487(A)—1951
- Portable spectroscopes and spectrometers used in undergraduate instruction, accessories for, A. N. Lucian. **2**: 168—1934
- Simple device for focusing a spectrometer telescope for parallel light, Alfred H. Weber. **3**: 130—1935
- Simple spectrometer for use in the elementary laboratory, R. W. McLachlan and F. R. Johnson. **2**: 172—1934
- Simplified spectrometer for use in the elementary physics laboratory, J. Stanley Johnson. **14**: 209(A)—1946
- Steinheil spectroscope of 65 years ago, Howard Long. **18**: 318(T)—1950
- Student spectrograph from surplus equipment, Ralph A. Loring. **19**: 329(A)—1951
- Student spectrometer from surplus materials, R. A. Loring and R. L. Remely. **17**: 460(T)—1949; Ralph A. Loring. **18**: 519(A)—1950
- Study of the Raman effect, inexpensive apparatus for, Forrest F. Cleveland and M. J. Murray. **5**: 270—1937
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- Adiabatic calorimeter, J. S. Arthur. **16**: 58(T)—1948
- Angstrom pyrheliometer in the laboratory, G. A. Shook. **1**: 91(A)—1933
- Automatic pressure-regulating unit for vacuum distillation, E. H. Huntress and E. B. Hershberg. **1**: 90(A)—1933
- Boyle's law—tilting J-tube, H. W. Harmon. **15**: 163(T)—1947
- Construction of thermodynamic models for elementary teaching, Jesse W. M. DuMond. **9**: 234—1941
- Efficient, inexpensive hot plate, L. C. Kreider. **4**: 55(A)—1936
- Expansivity of mercury, apparatus for determining, B. H. Dickinson. **18**: 165(T)—1950
- Experimental hot-air engine, W. Horn. **11**: 232(T)—1943
- Fitch's apparatus for the measurement of thermal conductivity, John Satterly. **19**: 132(L); Frank P. Fritchle. **19**: 475(L)—1951
- Gas law demonstration apparatus, F. C. Hickey. **13**: 5(A)—1945
- Improved apparatus for the determination of Joule's equivalent by the electrical method, J. H. McLeod. **3**: 183—1935
- Improved boiling-point apparatus, Herbert L. Davis. **1**: 27(A)—1933
- Improved Franklin's flask and simplified cryophorus, Isay Balinkin. **1**: 55(T), 86—1933
- Inexpensive micro-burner, V. T. Jackson. **3**: 197(A)—1935
- Investigating the variable specific heat of carbon, apparatus for, Ernest Frank. **9**: 227—1941

Kinetic molecular theory of gases, apparatus to demonstrate, L. de St. Paër. **8**: 330(A)—1940

Lecture apparatus for thermal conduction, Albert Sprague Coolidge. **12**: 175—1944

Measurement of vapor pressures, apparatus for, Alvin W. Hanson. **13**: 266(A)—1945; **14**: 55—1946

Modified cryophorus, Ross A. Baker. **7**: 424—1939

Modified thermal expansion apparatus, Harry E. Wolf. **9**: 187—1941

New Boyle's law apparatus, Ira M. Freeman and Karl W. Meissner. **11**: 132—1943

New thermal conductivity apparatus, A. L. Fitch. **3**: 135—1935

Projection apparatus for gas laws, T. B. Brown. **12**: 241(T)—1944

Radiometer, R. A. Goodwin. **12**: 241(T)—1944

Radiometer, selective heating effect in, Howard A. Carter. **19**: 386(L)—1951

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Self-regulating electrolytic immersion heater, F. E. Holmes. **15**: 363(A)—1947

Simple apparatus for study of the gas laws, O. F. Steinbach and G. F. Conery. **12**: 245(A)—1944

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Simplified electronic thermoregulator, W. E. Gilson and H. A. Wooster. **11**: 116(A)—1943

Small oxygen liquefier, Lester I. Bockstahler. **16**: 122(A)—1948

Thermometers of the Royal Society, 1663-1768, Louise Diehl Patterson. **19**: 523—1951

Two-dimensional kinetic theory model, Thomas B. Brown. **9**: 168—1941

Vapor pressure apparatus for laboratory use, A. H. Croup. **1**: 55(T), 85—1933

Vapor pressure-temperature apparatus, R. L. Judkins. **18**: 392(T)—1950; Roy L. Judkins and G. P. Brewington. **19**: 380—1951

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Another substitute for stop watches, W. H. Michener. **5**: 41—1937

Atomic clock, Harold Lyons. **17**: 391(T)—1949

Automatic control and timing device, Alfred H. Weber and Edward J. Grill. **9**: 381—1941

Clocks, Airy's theorem and improvement of, Paul F. Gaeher. **16**: 336; Erratum. **16**: 420—1948; A. L. Rawlings. **17**: 519(L); Reply, Paul F. Gaeher. **17**: 520(L)—1949

Electric timers and motors for laboratory use on alternating-current circuits of constant frequency, E. L. Harrington. **2**: 170—1934

Electrically driven tuning fork as a source of constant frequency for the precise measurement of short intervals of time. R. B. Dow. **4**: 199—1936

Electronic impulse timer, C. W. Sheppard. **11**: 43—1943

Fast coincidence analyzer, Charles C. Rayburn and T. M. Hahn, Jr. **19**: 400(A)—1951

Inexpensive tachometer of high accuracy, F. C. Walz and R. V. Cartwright. **5**: 221(A)—1937

Low cost spark-timer with wide frequency range, Everett F. Cox and Paul R. Gleason. **5**: 45(A)—1937

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Pendulum timer for the elementary laboratory, W. W. McCormick. **7**: 260—1939

Photoelectric interval timer, R. D. Park. **14**: 322—1946

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Simple chronoscope for measuring time intervals to thousandth of a second, A. G. Worthing. **3**: 44(T)—1935

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Simple electronic timer, R. R. Palmer. **17**: 335(T)—1949

Simple laboratory timer, Herschel Smith. **4**: 136—1936

Spark timer and an impulse counter used as an inertia balance, H. Petterson. **19**: 400(T)—1951

Stop clock with magnetic fluid clutch, V. Eaton. **19**: 330(A)—1951

Switch for stopclocks, Lewis S. Combes. **8**: 66—1940

Time standard for the physics laboratory, H. T. Smith. **16**: 324(T), 365(T)—1948

Two simple devices for measuring time intervals in a physical laboratory, Robert M. Woods and Noel C. Jamison. **7**: 70(A)—1939

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- Sample illustrations of physical principles selected from physiology and medicine, L. A. Strait, V. T. Inman, and H. J. Ralston. 15: 375—1947
- Significance of complementarity for the life sciences, William G. Pollard. 20: 281, 396(T)—1952
- Some physico-mathematical aspects of nerve-conduction, N. Rashevsky. 1: 126(A)—1933
- Some problems in radiation biology, Robert L. Sinshemer. 18: 462(T)—1950
- Story of vitamin B<sub>1</sub>, R. R. Williams. 17: 460(T)—1949
- Ultrasonics, biological and psychological effects of, Hallowell Davis. 17: 48(A)—1949
- Cosmic Rays**
- Application of crystal counters to cosmic ray studies, J. C. Street. 16: 366(T)—1948
- Certain aspects of cosmic rays, Marcel Schein. 15: 433(T)—1947
- Cosmic-ray neutrons, Serge A. Korff. 19: 226—1951
- Cosmic ray showers at low altitudes, C. G. Montgomery. 16: 366(T)—1948
- Cosmic rays, R. B. Sawyer. 5: 21(T)—1937; W. F. G. Swann. 11: 233(T)—1943
- Cosmic rays at high elevations, E. P. Cooper. 16: 325(T)—1948
- Cosmic rays—their history, source, nature and effects, J. C. Sterns and D. K. Froman. 7: 79—1939
- Cosmic rays—what physicists have learned about them, Karl K. Darrow. 1: 93(T)—1933
- Geographic study of cosmic rays, Arthur H. Compton. 1: 58(A), 59(A)—1933
- Intensity coefficients of cosmic-ray components, D. H. Loughridge. 17: 360(T)—1947
- Interpretation of cosmic ray phenomena, Bruno Rossi. 16: 366(T)—1948
- Measurements of the lateral distribution of extensive air showers, Morton A. Levine. 20: 394(T)—1952
- Nature of cosmic-ray particles, Martin A. Pomerantz. 12: 179(T)—1944
- Near-neighbor effect in cosmic-ray stars, Kenneth M. King. 19: 483(T)—1951
- Origin of cosmic rays, Albrecht Unsöld. 19: 136(T)—1951
- Penetrating showers in lead, W. B. Fretter. 17: 148—1949
- Physics of high energy particles; cosmic rays, E. Fermi. 7: 200(T)—1939
- Problem of cosmic rays, Watson Davis. 1: 60(T)—1933
- Recent developments in cosmic rays, A. H. Compton. 4: 48(T)—1936
- Secret message of the cosmic rays, Arthur H. Compton. 1: 126(T)—1933
- Solar activity as the origin of cosmic rays. W. W. Salisbury. 16: 366(T)—1948
- Study in cosmic radiation, Charles Kissinger. 16: 325(T)—1948
- Theory of collision; scattering of fast electrons and cosmic-ray particles, E. J. Williams. 7: 200(T)—1939
- Theory of the solar origin of cosmic rays, Winfield W. Salisbury. 17: 93(A)—1949
- Cosmography**
- Age determinations by radioactivity, H. R. Crane. 19: 136(T)—1951
- Age of the universe, A. E. Whitford. 18: 430(T)—1950
- Can we account for the observed abundance of the chemical elements? D. ter Haar. 17: 282—1949
- Celestial (nuclear) chemistry, T. H. Dunkelberger. 20: 598(A)—1952
- Dynamical problems in the evolution of the solar system, Herbert Jehle. 15: 195(A)—1947
- Hydrodynamics in cosmic physics, Edward Teller. 18: 462(T)—1950
- Material of interstellar space, E. B. Ebbighausen. 14: 447(T)—1946
- On facts and fancies in cosmogony, Harlow Shapley. 1: 95(A)—1933
- On the nature and the limitations of cosmical inquiries, P. W. Bridgman. 2: 40(A)—1934
- Origin of the lighter elements, William Band. 19: 251(A)—1951
- Problem of supernovae explosions, G. A. Gamow. 11: 231(T)—1943
- Some chemical evidence relative to the origin of the earth, Harold C. Urey. 18: 462(T)—1950
- Structure and physical properties of interstellar gas clouds, Bengt Stromgren. 19: 443(T)—1951
- Universe in the red, George W. Gray. 1: 28(A)—1953
- Courses**
- Advanced*
- Acoustics as a required course for music students, R. I. Allen. 7: 265(A)—1939
- Acoustics for students of music, Chas. Williamson. 1: 122—1933
- Advanced undergraduate course in radiation physics, laboratory experiments for, C. M. Ziemann. 19: 399(T)—1951
- Applied spectroscopy, course in, J. Howard McMillen. 11: 126—1943
- Architectural physics, Will V. Norris. 18: 300, 334(A)—1950
- Changes advisable in the courses in electricity and magnetism, M. Katherine Frehafer. 13: 125(T)—1945
- College courses in electron microscopy, Robert L. Weber. 20: 301—1952
- College courses in physical meteorology, John G. Albright. 8: 282—1940



- Content of a first course in modern physics, John A. Eldridge. 4: 52(A)—1936
- Defense training course in radio technics, Willis Rayton. 10: 166(T)—1942
- Defense training courses in acoustics, Vern O. Knudsen. 10: 160—1942
- Development of a course in nuclear instrumentation, R. J. Stauverman. 20: 392(A)—1952
- Electronics, course as training in research methods, Marcus O'Day. 7: 263(A)—1939
- Electronics for small colleges, course in, C. L. Rich. 16: 365(T)—1948
- Elementary courses for senior mechanical engineering students, Elmer Hutchisson. 17: 461(T)—1949
- Engineering courses bearing applications of nuclear energy, Robert G. Ernst. 20: 526(T)—1952
- ESMDT foundations-of-engineering course offered by the Extension Service of the Pennsylvania State College, Marsh W. White. 10: 209(T)—1942
- Experimental course in reactor physics at the Oak Ridge School of Reactor Technology, E. C. Campbell. 19: 443(T)—1951
- Experimental reactor physics course of the Oak Ridge School of Reactor Technology, Ernest D. Klema. 20: 393(A)—1952
- Integrating course for the physics major, Carl E. Adams and Ralph A. Loring. 10: 250(T)—1951
- Intermediate course in physics: a method of teaching, Karl H. Fussler. 14: 209(A)—1946
- Laboratory course in atomic physics, O. Oldenberg and F. F. Rieke. 2: 163—1934
- Laboratory course in electronics, H. L. Schultz and W. G. Wadey. 18: 522(A)—1950; 19: 214—1951
- Laboratory course in x-rays, Paul Kirkpatrick. 8: 326(A)—1940; 9: 14—1941; supplementary experiments. 10: 233—1942
- Laboratory equipment for a course in electronics, K. S. Lion. 15: 161—1947
- Modern physics as a second-year course in physics, J. J. Brady. 8: 326(A)—1940
- Modern physics, chronology of, A. R. Tobey. 19: 167—1951
- Modern physics course at MIT, Francis W. Sears. 20: 526(T)—1952
- Modern-physics laboratory course, F. L. Talbot. 7: 263(T)—1939
- Modern physics, laboratory course in, Carl C. Sartain. 19: 443(A)—1951
- Modern physics without prerequisites—an experiment, course in, K. H. Fussler and J. W. Straley. 16: 362(A)—1948
- New course in electricity, M. A. Starr. 15: 92(T)—1947
- New course in radiation physics, E. G. Ebbighausen. 15: 92(T)—1947
- Physics course for students of music. R. T. Dufford. 4: 51(T)—1936
- Preprofessional orientation course for physics majors, Stanley S. Ballard. 19: 330(A)—1951
- Professional course in physics for teachers of elementary grades, W. B. Miner. 20: 466(A)—1952
- Professional laboratory course for science teachers, G. P. Cahoon. 8: 331(A)—1940
- Proposed experimental physics course for seniors, R. S. Caswell. 20: 388(A)—1952
- Proposed intermediate course in spectroscopy, William Lewis. 17: 460(T)—1949
- Second-year course in general physics for college transfer students at the Massachusetts Institute of Technology, Clarence E. Bennett. 2: 158—1934
- Senior course in geophysics and geophysical methods at Texas A & M, D. F. Weekes. 16: 363(T)—1948
- Special courses needed for nonscience majors, J. F. Mackell. 19: 399(T)—1951
- Specialized physics, C. Harrison Dwight. 19: 97—1951
- Training men in acoustics and supersonics for war research, Leonard O. Olsen. 10: 262—1942
- Training of undergraduates in nucleonics, W. R. Kanne. 20: 526(T)—1952
- Training of weather officers in wartime, Carl B. Alenderfer. 11: 153—1943
- Ultrasonics as a subject in the physics curriculum, Paul J. Ernst and Charles W. Hoffman. 20: 325(A)—1952
- Undergraduate course in radiation physics, K. Watanabe. 16: 324(T)—1948; Clayton M. Zieman. 20: 213, 325(A)—1952
- Undergraduate course on theory of measurement, K. H. Moore. 17: 461(A)—1949

#### Curricula

- Ancient science in the modern curriculum, J. J. G. McCue. 16: 404—1948
- Course and curriculum, Erland Ritchie. 17: 164(T)—1949
- Curricula for physics majors, W. C. Kelly. 18: 335(A)—1950
- Curriculum changes at Massachusetts Institute of Technology. 12: 241—1944
- Curriculum in physics at the University of Chicago, Harold R. Voorhees. 18: 393(T)—1950
- Curriculum problems of physics departments, Jesse C. Hendricks. 16: 324(T)—1948
- Curriculum trends in the physical sciences at the University of Chicago, James B. Parsons. 18: 393(T)—1950
- Differentiated physics courses at the University of Pittsburgh, Oswald Blackwood. 18: 526(A)—1950
- Engineering physics at Cornell, Lloyd P. Smith. 19: 174—1951
- Extension training and ESMWT physics and radio courses, H. R. Vinyard. 11: 170(T)—1943
- Growth and changes in the engineering physics curriculum at the University of Illinois, P. G. Kruger. 11: 232(T)—1943
- Intensive study schedules, Gilbert Myers. 18: 394(T)—1950
- Intra- and extra-curricular war courses at Smith College, Nora M. Mohler. 11: 50(T)—1943

- Minimum curriculum for small departments, R. E. Martin. 19: 399(T)—1951
- Modernizing and improving the undergraduate physics curriculum. 19: 399(T)—1951
- Modernizing the undergraduate physics curriculum: proposed change at Washington University, A. L. Hughes. 15: 49—1947
- Nature and objectives of the physics program at Carroll College, V. P. Batha. 18: 430(T)—1950
- Observations on the objectives and the teaching of physics in England and Canada, John Satterly. 7: 1—1939
- Physics courses in the curricula of the technical institutes, Marsh W. White. 14: 341(T)—1946
- Physics curriculum at Brooklyn College, Frances O. Severinghaus. 20: 173—1952
- Physics in the commerce curriculum at the University of Cincinnati, C. H. Dwight. 2: 111—1934
- Physics in the Navy, Fred K. Elder, John A. Tiedeman, Lawrence E. Kinsler, John D. Riggin, E. R. Pinkston, and Ralph A. Goodwin. 12: 279—1944
- Physics museum of the University of Chicago and its relation to the new curriculum, Harvey B. Lemon. 2: 10—1934
- Preprofessional undergraduate curriculum in physics, Stanley S. Ballard. 18: 335(A)—1950
- Problem of introduction of the new material into the undergraduate program; (A) the organization of the new material in the courses; (B) the selection and development of equipment to be used in the courses, Jacob A. Rinker. 17: 94(A)—1949
- Proposed reorganization of undergraduate physics, A. E. Caswell and Walter Cordy. 13: 315—1945
- Recent curricular developments at the University of Chicago, T. A. Ashford, R. J. Stephenson, and M. J. Ference. 6: 167(T)—1938
- Revision of the junior and senior undergraduate curriculum at Washington University, A. L. Hughes. 14: 341(T)—1946
- Status of courses in physics and of physics departments in institutions of higher education—October, 1942, George H. Burnham. 11: 78—1943
- Status of curriculums in applied physics, Homer L. Dodge. 5: 46(T)—1937
- Introductory*
- Attempt toward more wisdom and less knowledge, Richard Schlegel. 17: 93(A)—1949
- Basic-concepts course in physics, A. G. Worthing. 15: 197(A), 318—1947
- Block-and-gap physics course, flashback teaching technique applied to, A. J. Hatch and D. F. Cope. 19: 137—1951
- Complete physics course through electric trains, Harry Peach. 20: 314(L)—1952
- Content of high school physics course, S. W. Cram. 12: 112(A)—1944
- Cultural course in college physics for nontechnical students, W. S. Webb. 13: 120(T), 307—1945
- Cultural courses in physics, William S. Webb. 7: 263(T)—1939
- Engineering physics in the freshman year, Henry Hartig. 15: 432(T)—1947
- First year of two-year science program at Amherst College, Theodore Soller. 18: 519(T)—1950
- Heresy concerning specialized physics courses, G. W. Stewart. 1: 55(T), 65—1933
- Household physics, courses in, Waldemar Noll. 8: 264(A)—1940
- Laboratory arts course in physics, Raymond Morgan. 16: 324(T)—1948
- Laboratory course with a plot, George B. Welch. 3: 69—1935
- Modification of the traditional approach to college physics, L. W. Taylor. 1: 68, 96—1933
- Non-numerical physics for nonscience students, Clarence E. Bennett. 10: 54(A)—1942
- Nonscience majors, course for, W. J. Jackson and E. A. Townsend. 17: 234(A)—1949
- Physics as a cultural course in women's colleges, Mary Helen Dodd. 7: 265(A)—1939
- Physics-chemistry sequence, J. B. Hoag. 14: 142(A)—1946
- Physics courses of selected engineering schools, Earl W. Thomson. 14: 341(T)—1946
- Physics for humanities majors, N. Goldowski. 17: 391(A)—1949
- Physics laboratory arts; an undergraduate course, Harry Hill. 18: 526(A)—1950
- Principles of physics in the courses taken by midshipmen, Walter E. Peterson. 12: 110(A)—1944
- Refresher courses for secondary school teachers, P. N. Powers and W. H. Stickler. 15: 436(A)—1947
- Refresher program for high school physics teachers, Elmer Hutchisson. 17: 234(A)—1949
- Remarks on teaching concentrated physics courses, F. T. Rogers, Jr. 11: 46(A)—1943
- Samples *versus* survey in physics courses for liberal arts students, Eric M. Rogers. 12: 113(A)—1944; 14: 384—1946
- Student projects in physics at Kalamazoo College, Howard S. Seifert. 8: 171—1940
- Subject matter for a course in general college physics, R. F. Paton. 11: 45—1943
- Suggestions for a new second-year course in physics, C. J. Lapp. 6: 42(T)—1938
- Summer refresher program for high school physics teachers, Elmer Hutchisson. 17: 567—1949
- Survey course in physics for seniors in engineering, Marsh W. White. 1: 21(T), 55(T)—1933
- Third-semester high school course in physics, G. M. Koehl. 11: 231(T)—1943
- Third-semester physics course, J. Gordon Stipe, Jr., and Isabel Boggs. 19: 443(A)—1951
- Two-year course in basic elementary physics, G. Forman, P. Rudnick, F. G. Slack, and N. Underwood. 17: 22—1949

- Two-year course in physics for engineering students, Francis G. Slack and Guy Forman. 16: 363(A)—1948
- Two-year program in general physics, Clarence E. Bennett and Karl D. Larsen. 6: 42(A), 201—1938
- Two-year science program in Columbia College, J. R. Dunning and H. W. Farwell. 5: 150—1937
- Two-year sequence for the general course in college physics, Thomas B. Brown. 7: 68(A)—1939
- Unified approach to physics, Noel C. Little. 18: 335(A)—1950; 19: 351—1951; Review by W. P. Gilbert. 18: 430(T)—1950
- Variability in the first courses in general college physics, Karl F. Oerlein. 5: 80—1937
- What is a cultural physics course? R. J. Havighurst. 1: 21(T), 33—1933

#### *Photography*

- Need for more college instruction in photography, Wallace E. Dobbs. 9: 176—1941
- Organizing a college credit course in photography, Miles J. Martin. 7: 116—1939
- Photography—a service course, Leda Cadle. 15: 361(A)—1947
- Photography as a college subject, J. C. Garman. 8: 326(A)—1940
- Photography in the physics curriculum, Paul E. Boucher. 5: 85—1937; Carl W. Miller. 9: 49(T), 107—1941
- Place of photography in the physics curriculum, Paul E. Boucher. 5: 45(T)—1937
- Plea for instruction in photography in high schools, Tyler Gaskill Price. 2: 187(A)—1934
- Suitability of photography as a university credit course in physics, J. E. Mack and M. J. Martin. 6: 42(A)—1938
- Summer courses in photography at Rochester. 5: 132—1937
- Teaching of photography, Wilson Woodcock. 7: 394—1939
- Teaching photography at the University of Texas, J. M. Kuehne. 16: 362(T)—1948

#### *Physical Science*

- Appraisal and criticism of survey courses, E. H. Dixon. 9: 194(A)—1941
- College physical science courses in general education, C. C. Clark. 17: 234(A); 267—1949
- Combined chemistry-physics course, E. C. Fuller. 16: 92(A)—1948
- Development of a course "Backgrounds of Science," Norris W. Goldsmith. 19: 330(A)—1951
- Difficulties in offering a physical science course, June Phillipot. 17: 335(T)—1949
- Experiment in cooperative education, Monica Healea. 14: 186—1946
- Integrated physics-mathematics course for the ESMDT program, Marsh W. White. 10: 54(A)—1942
- Natural science, survey courses in, Robert J. Havighurst. 3: 97—1935

- Physical science courses for liberal arts students, Reginald J. Stephenson. 12: 238(T); R. J. Stephenson. 12: 225—1944
- Physical science for students of liberal arts, J. J. G. McCue. 17: 47(T)—1949
- Physics survey courses *versus* physical science survey courses as agencies of general education, Willard Geer. 7: 389—1939
- Report on introductory general courses in physical science at the University of Chicago, Harvey B. Lemon. 2: 31(T)—1934
- Science survey, Ralph W. Hufford. 2: 125(A)—1934
- Some essential features and uncommon objectives of a physical science course for the general student, Duane Roller. 14: 390—1946
- Survey course of the physical sciences for college freshmen, Will V. Norris. 2: 80(A)—1934
- Survey courses in the physical sciences, G. F. Barnes. 6: 167(A)—1938
- Survey courses (Recent publications and teaching aids). 6: 165, 339—1938
- Two experiments in adult education at Wellesley College, Louise S. McDowell. 12: 174—1944
- What educational needs have favored the development of survey courses in the natural sciences? S. R. Powers. 3: 191—1935

#### *Premedical Physics*

- Course in physical instrumentation for medical and biological research, K. S. Lion and F. O. Schmitt. 15: 195(T)—1947
- On physics in relation to medicine, E. L. Harrington. 2: 176—1934
- Physics for premedical students, H. B. Williams. 1: 22(T)—1933
- Physics for students in the premedical and in the biological courses, E. L. Harrington. 5: 221(A)—1937
- Physics in premedical education, Otto Blüh. 17: 156—1949
- Physics in the premedical and premedical curriculum, Arthur G. Barkow. 16: 236—1948; A. G. Barkow. 16: 365(T)—1948
- Present trends in university courses in general physics for premedical students, E. L. Harrington. 18: 336(A); 428—1950
- Problem of the premedical course, Clyde B. Crawley. 6: 167(A)—1938
- Renewed interest in physics courses for medical students, Duane Roller. 12: 382—1944
- Second year physics course for biology and premedical students, L. L. Barnes. 18: 519(T)—1950
- Teaching of physics to premedical students, J. K. Robertson. 19: 131(L)—1951

#### **Demonstrations**

##### *Acoustics*

- Acoustic experiments in the teaching of optics, a demonstration lecture, Harold K. Schilling. 6: 41(T)—1938



- Acoustic plane and space gratings, experiments with, James W. McGrath. 7: 337—1939
- Apparatus for projecting phonodeik oscillations, J. G. Black. 1: 21(T), 49—1933
- Approaching the study of interference through acoustics, Harold K. Schilling and William Whitson. 4: 27—1936
- Auditory perspective and acoustic regeneration, simple demonstrations of, G. P. Brewington. 6: 214—1938
- Beats and the Doppler effect, demonstration of, Julius Sumner Miller. 18: 400(L)—1950
- Diffraction and interference of sound, demonstration of, Everett K. Jenne. 19: 397(A)—1951
- Doppler effect—a lecture demonstration, Arthur S. Jensen. 13: 39; A. S. Jensen. 13: 126(T)—1945
- Doppler effect, demonstrating the, C. W. Heaps. 9: 313—1941
- Doppler effect, demonstration of, John Zeleny. 10: 120—1942; Francis E. Fox. 12: 228; F. E. Fox. 12: 241(T)—1944; reply to Professor Zeleny, C. W. Heaps. 10: 121—1942
- Effect of intensity upon pitch, simple demonstration of, Arthur Taber Jones. 5: 139—1937
- Georgian chant—an illustrated lecture, C. Zech. 9: 244(T)—1941
- Harmonics and beats, demonstrating, Richard C. Hitchcock. 19: 329(A); 445—1951
- Koenig's interference apparatus, Paul F. Gaehr. 15: 426—1947
- Lecture demonstration of longitudinal waves, W. W. Sleator. 17: 178—1949
- Lecture demonstration of nodal patterns, E. R. Pinkston. 14: 138(A)—1946
- Lecture-table telephotophone, Richard M. Sutton. 2: 31(T)—1934
- Method for the determination of the speed of sound, demonstration of, Albert May. 8: 264(T)—1940
- Phonodeik, demonstration, G. G. Kretschmar. 4: 90—1936
- Propagation of sound, W. Llowarch. 11: 234(A)—1943
- Quantitative laboratory demonstrations in sound, Winthrop R. Wright. 8: 255—1940
- Radio fundamentals and speech quality, demonstration of, Lynn W. Jones. 10: 330—1942
- Resonant (singing) tubes, E. R. Pinkston. 15: 432(T)—1947
- Ripple tank and the Doppler effect, Hiram W. Edwards. 1: 92(A)—1933
- Schilling acoustic experiments for teaching optics, demonstration of, E. N. McWhite and C. W. Edwards. 7: 265(T)—1939
- Schlieren effect, demonstration of, C. A. Beck. 13: 126(T)—1945
- Some observations on Chladni figures, Julius Sumner Miller. 18: 534(L)—1950
- Some supersonic phenomena, demonstrations of, G. W. Pierce. 2: 31(T)—1934
- Specific acoustic resistance, demonstration of, John S. Rinehart. 18: 546—1950
- Standing sound waves demonstration on, Robert R. Meijer. 16: 360—1948
- Timbre of sound, demonstration of, Rose A. Carney and John J. Spokas. 20: 326(A)—1952
- Tuning forks, demonstration experiments with, Eric Rogers. 10: 166(A)—1942
- Two demonstrations in acoustics, Charles Williamson. 6: 40(T)—1938
- Visual demonstration of a measurement of the speed of sound in air, E. Tyler. 6: 277—1938
- Visual method for demonstrating refraction of sound, Haym Kruglak and Charles C. Kruse. 8: 260—1940
- Wave fronts, attenuation, and diffraction, demonstration of, W. Cullen Moore. 20: 61—1951

*Atoms and Molecules*

- Atomic structure, demonstrating, Ralph E. Wellings. 1: 57(A)—1933
- Atoms demonstration, Staley and Shriner. 18: 318(T)—1950
- Device for illustrating atom models, Carl Van Valkenburg. 8: 262—1940
- Exhibiting Brownian movement, appliance for, Louis E. James and W. James Lyons. 2: 25—1934
- Experimental demonstrations in molecular physics, Hans Mueller. 2: 31(T)—1934
- Model to illustrate the motion of a diatomic rotator with two degrees of freedom, Lewis Simons and E. H. Smart. 1: 57(A)—1933
- Molecular motion, demonstration of, W. S. Von Arx. 13: 205(A)—1945
- Simple demonstration model of a vibrating molecule, W. H. J. Childs. 6: 169(A)—1938
- Simple device for demonstrating Brownian movement in gases, D. A. Wells and William Lange. 1: 26(A)—1933

*Electricity*

- A.c.-d.c. voltage relationships, simple apparatus for demonstrating, Leo Seren. 16: 449—1948
- Alternations of a.c. current, demonstration of, Paul E. Wilson. 3: 46(A)—1935
- Analogy to the electromotive force, potential difference and resistances in a circuit, simple demonstration of, Leonard B. Loeb and H. M. Herreman. 4: 34—1936
- Apparatus for demonstrating and mapping an electric field, Rev. B. Brinker. 18: 318(T)—1950
- Apparatus for the electrolysis and synthesis of water and the photosynthesis of HCl, J. G. Black. 1: 119—1933
- Audible method of demonstrating transient oscillations in single and coupled tuned circuits, Herbert J. Reich. 2: 27—1934
- Automatic chart plotter for lecture room demonstrations, Alfred O. Nier and R. B. Thorness. 19: 416—1951
- Behavior of a carbon-filament lamp in a magnetic field when energized with (a) alternating current, (b) direct current, Julius Sumner Miller. 17: 447(L)—1949

- Bells and spark coils, G. Ghey. 9: 317(A)—1941
- Condensers in a.c. and d.c. circuits, W. B. Pietenpol. 15: 197(A)—1947
- Convenient projection electroscope, Harry E. Hammond. 3: 39—1935
- Damped electrical oscillation demonstrated with a cathode-ray oscilloscope, Hugh Ivey. 18: 400(L)—1950
- D.c. selsyn, demonstration of, C. A. Beck. 11: 232(T)—1943
- Detonation of electrolytic gas, A. F. Williston. 11: 300(A)—1943
- Demonstration of the dielectric constant of air, E. W. Cheney. 15: 515—1947
- Demonstration of eddy currents in conductors of various shapes, D. Brown. 1: 125(A)—1933
- Effect of a shunt, simple demonstration of, Arthur Taber Jones. 3: 138—1935
- Electric field lines, demonstrating, L. Gorse. 11: 234(A)—1943
- Electrical resonance, demonstration of, F. E. Fox. 8: 264(T)—1940
- Electromagnetic induction, demonstration experiments in, D. S. Ainslie. 18: 519(A)—1950; 19: 232—1951
- Emission current through a glass bulb, demonstration of, K. S. Lion. 11: 297—1943
- Experiment to demonstrate that "frictional" electricity depends on contact potential, Stanley Anderson. 4: 144—1936
- Frequency of alternating current, G. K. Schoepfle. 15: 363(A)—1947
- Frequency of the alternating current by visual method, David L. Cook. 1: 125(A)—1933
- Glow tube flasher for demonstrating condenser properties, V. Wouk. 13: 415—1945
- High voltage and induction heating demonstrations, Richard Aurandt. 19: 398(T)—1951
- Illustrating the flow of electricity in circuits, demonstration apparatus for, Frank R. Pratt. 3: 189—1935
- Improved apparatus for demonstrating an oscillatory discharge, Edwin S. Fox. 19: 486(A)—1951
- Induced electromotive force, new apparatus for demonstrating, Hermann Haemmerle. 17: 317—1949
- Lecture demonstration of coupled systems employing selsyn motors to provide variable coupling, Lloyd W. Morris. 19: 443(A)—1951
- Lecture demonstration of simple transient electrical phenomena, L. P. Delsasso. 15: 468—1947
- Mechanical analogs of electric circuits, demonstration experiments, Eric M. Rogers. 14: 318—1946
- Mechanical method of showing alternating current phase relations, Waldemar Noll and William Nickell. 7: 265(T)—1939
- Mechanical model illustrating, the principle of the cyclotron, F. A. B. Ward. 8: 205(A)—1940
- Mechanical switching arrangement for oscillograph demonstrations of certain electric transients, L. E. Smith, Jr. 9: 50—1941
- Megohmmeter, demonstration of, G. Vassallo. 13: 57(T)—1945
- Method of simultaneously projecting two periodic curves on a cathode-ray oscillograph, F. E. Kennard. 6: 169(A)—1938
- Modification of the traditional demonstration of the e.m.f. of self-induction, Grant O. Gale. 5: 229—1937
- Neon lamps for electrical measurements and demonstrations, D. S. Ainslie. 1: 119—1933
- Oscillatory discharge of a condenser, demonstration of, H. E. Hammond. 10: 162—1942; Kenneth V. Manning. 18: 333(A)—1950
- Peltier effect, demonstration of, Robert W. Koza. 13: 62, 266(A)—1945
- Phase differences in alternating-current circuits, stroboscope for the demonstration of, E. Hobart Collins. 11: 38—1943
- Phase relations in an inductance demonstrated at low frequency, G. E. Feiker and W. B. Wadsworth. 7: 60—1939
- Phase shift, demonstration of, Franklin Miller, Jr. 19: 366—1951
- Potentiometer, demonstration, P. Bender. 15: 435(A)—1947
- Production of a variable low frequency alternating voltage and its application to the study of transient and steady state phenomena, Lloyd W. Morris. 6: 44(A)—1938
- Relationships between ac and dc voltage, demonstration of, Albert V. Baez. 19: 399(A)—1951
- Relationships between ac and dc voltage, demonstration on, Albert V. Baez. 20: 457(L)—1952
- Rotating field, demonstrating, Charles R. Mingins. 5: 137—1937
- Simple and effective device for production of Lissajous' figures with an oscillograph, G. G. Kretschmar. 8: 321—1940
- Simple arrangement for observation of electrical transients, Edward H. Green. 5: 181—1937
- Simple demonstration telephone switchboard and its operation, Lloyd W. Taylor and Paul F. Brown. 5: 215—1937
- Simple transient oscillatory electrical phenomenon, demonstration of, L. P. Delsasso. 15: 360(T)—1947
- Special charging rod for demonstrations in electrostatics, D. S. Ainslie. 12: 43—1944
- Student computation in electricity, demonstration experiments to provide data for, T. J. Blisard and B. A. Greenbaum. 20: 399(A)—1952
- Teaching electric circuits, demonstrator boards for, Haym Kruglak. 14: 273—1946
- Temperature coefficients of resistance, positive and negative, W. B. Pietenpol. 14: 138(A)—1946
- Ten demonstrations in piezoelectricity, K. S. Van Dyke. 18: 519(T)—1950
- Transients, demonstration with cathode-ray oscillograph, T. B. Brown. 9: 244(T)—1941
- Unique oscillographic demonstrations, Frank E. Hoecker and A. Graham Asher. 8: 59—1940
- Van de Graaff generator for demonstration purposes, Richard H. Waters. 19: 195(T)—1951

Variation of electrical resistance with temperature, demonstration of, John J. Heilemann. 1: 17—1933  
 Volta effect, demonstration of, E. F. Fox, 11: 231(T)—1943

#### *Electronics*

Analogue computer for differential equations, high speed counter of several thousand per second, super stop watch, a memory tube, demonstration of, Cyril N. Hoyler. 17: 460(T)—1949  
 Circular polarization of ionospherically reflected radio waves, simple demonstration of, Edward V. Appleton 11: 236(A)—1943  
 Classroom model of vertical ionospheric reflection, J. A. Pierce. 17: 542—1949  
 Compact thyratron demonstration apparatus, T. A. Benham. 12: 166—1944  
 Edison effect and the rectifying action of a diode, demonstrations of, Simon Sonkin. 5: 41—1937  
 Electronic demonstrator for damped electric oscillations, W. G. Marburger. 20: 516—1952  
 400-mc oscillator, demonstration of, Thomas B. Brown. 7: 263(T)—1939  
 Half-wave and full-wave rectification, demonstration of, Joseph S. Rosen. 12: 174—1944  
 Improved apparatus for demonstrating an oscillatory discharge, Edwin S. Fox. 19: 486(A)—1951  
 Mechanical model of a vacuum tube amplifier, Louis R. Weber. 5: 133—1937  
 Modulation theory, demonstration of, T. B. Brown. 13: 125(T)—1945  
 Oscillograph outfit, demonstration, H. Lloyd. 3: 141(A)—1935  
 Radio side bands demonstration, Robert J. Dwyer. 11: 109—1943  
 Radio tube demonstration, Austin J. O'Leary. 3: 134—1935  
 Simple demonstration of the characteristic of an electron tube compared with that of an Ohm's law resistance, Eric M. Rogers. 8: 70(A)—1940  
 Unique classroom oscillographic demonstrations, Frank E. Hoecker. 7: 261(A)—1939  
 Visual demonstration of vacuum tube characteristics, Edward H. Green. 9: 191—1941  
 Voltage amplification of triode, demonstration of, F. L. Talbot. 11: 226, 231(T)—1943  
 Wave shaping demonstration, H. Fulton. 19: 196(T)—1951

#### *Electrons and Ions*

Classroom demonstration of the nature of the charge on the electron, A. D. Hummel. 8: 71(A)—1940  
 Conception and demonstration of electron waves, C. J. Davisson. 1: 29(A)—1933  
 Effect of an electric lens on water jets, S. Y. Sze and L. K. Su. 4: 139—1936  
 Electron paths perpendicular to a magnetic field, demonstration of, R. Stuart Mackay. 17: 444—1949  
 Electrostatic bubble gun for demonstrating deflection of charged particles, L. P. Delsasso. 15: 360(T)—1947

Lecture room determination of the velocity and  $c/m$  of the electrons in a cathode-ray oscillograph, H. D. Smyth and C. W. Curtis. 6: 158—1938  
 New lecture table demonstration to show that cathode rays leave the cathode normally, Chas. T. Knipp. 2: 184(A)—1934  
 Particle motion in an inverse square field of force, demonstration of, C. L. Henshaw. 11: 47(A)—1943  
 Removal of ions from convection currents, demonstration of, John J. Heilemann. 2: 116—1934  
 Simple demonstration of Child's law for positive ions, Winston E. Kock. 6: 152—1938  
 Uses for electrically charged balloons in the demonstration lecture, Paul Rood. 14: 445—1946

#### *Fluid Mechanics*

Another demonstration of Bernoulli principle, F. E. Kester. 13: 349—1945  
 Archimedes' principle and the hydrostatic paradox—simple demonstrations, George M. Koehl. 17: 579—1949  
 Barometer, demonstration, H. W. LeSourd. 14: 213(A)—1946  
 Bernoulli's principle, demonstration of, E. Scott Barr. 19: 248(L)—1951  
 High-vacuum technique—an undergraduate study, Harvey E. Wegner. 16: 412(A)—1948  
 Hydrostatic paradox: phase II, demonstration of, Laurence E. Dodd. 19: 195(A)—1951  
 Illustration of a conservation paradox, Richard M. Sutton. 4: 26—1936  
 Interesting application of Archimedes' principle, John M. Chilton. 16: 57—1948  
 Liquid pressure, demonstration of, H. W. LeSourd. 14: 278(A)—1946  
 Mariotte's bottle, E. L. McCarthey. 2: 184(A)—1934  
 Model to demonstrate the pressures effective in deep-sea diving, L. E. Dodd. 7: 261(A)—1939  
 Neglected lesson from the Cartesain diver, Paul Kirkpatrick. 10: 160—1942  
 Physics of deep-sea diving, Laurence Ellsworth Dodd. 8: 181—1940  
 Pressure-gauge tester, demonstration with, B. L. Brinker and A. P. Brinker. 14: 341(T)—1946  
 Properties of air flow, two experimental demonstrations of, G. P. Brewington. 11: 47(A)—1943  
 Some lecture and laboratory experiments in aeronautics, E. G. Richardson. 2: 22—1934  
 Stroboscopic observation of jets of water, George D. Rock and Albert May. 7: 248—1939  
 Water hammer made of metal, demonstration, Harold K. Schilling and Henry L. Yeagley. 12: 230, 239(T)—1944  
 Water runs up hill, or does it? John G. Betts. 19: 195(A)—1951  
 Wind-machine, demonstration, Wilfrid J. Jackson and Frank R. Pratt. 9: 57(A)—1941

#### *General*

A.A.P.T. book on demonstrations, Richard M. Sutton. 3: 85—1935



- Among my souvenirs, Richard L. Feldman. **6**: 105—1938
- Animations, demonstrating with, Robert L. Petry. **6**: 45(A)—1938
- Annual exhibit of new devices. **17**: 460(T)—1949; **18**: 462(T)—1950
- Apparatus for demonstrations, T. M. Hahn. **5**: 285(T)—1937
- Astronomy survey course, demonstrations useful for, Lewis Balamuth. **7**: 196—1939
- Challenging problems for general physics classes, Louis R. Weber. **14**: 139(A)—1946
- Comparison of the effectiveness of the demonstration method and of individual laboratory work in the teaching of physics in secondary schools, Julian M. Blair. **5**: 221(A)—1937
- Concerning lecture demonstrations, Julius Sumner Miller. **17**: 582(L)—1949
- Demonstrations and exhibits, F. W. Cooke, C. A. Culver, W. H. Eller, Z. V. Harvalik, G. W. Heitkamp, W. J. Hooper, R. R. Palmer, C. R. Smith, L. W. Taylor, E. R. Wightman, and J. W. Woodrow. **14**: 276(T)—1946; W. D. Bemmels, M. B. Brenne-man, D. L. Eaton, F. E. Christenson and J. W. Buchta, R. T. Harling, Z. V. Harvalik, H. Jensen, M. Olson, R. R. Palmer, A. G. Rouse, H. K. Schilling and I. Rudnick, C. R. Smith, M. N. States, L. A. Turner, J. A. Van den Akker. **15**: 433(T)—1947; W. D. Bemmels, Jerome Brewer, J. H. Clements, R. H. Cook, R. L. Edwards, J. A. Eldridge, G. O. Gale, Newell S. Gingrich, J. W. Hake, Roscoe E. Harris, Z. V. Harvalik, W. J. Hooper, H. C. Jensen, J. C. Jensen, K. G. Larson, Walter G. Marburger, Paul E. Martin, Waldemar Noll, Donald Olson, Milward T. Rodine, Louis Shapiro, Clarence R. Smith, Orrin H. Smith, Richard M. Sutton, Francis E. Throw, J. A. Van den Akker, and Earl W. Thomson. **16**: 366(T)—1948
- Demonstration experiment round table, R. H. Cook, H. C. Jensen, M. J. Pryor, Paul Rood. **20**: 464(T)—1952
- Demonstrations experiments, A. F. Johnson, R. M. Morrow, R. H. Mortimore, H. K. Schilling, C. R. Smith, R. D. Spangler, and V. F. Swaim. **7**: 200(T)—1939; Eric M. Rogers. **10**: 55(A)—1942; E. M. Rogers. **14**: 136(T)—1946; G. O. Gale, H. W. Gould, D. L. Eaton, A. W. Hanson, J. Harty, F. E. Hoecker, W. J. Hooper, and J. C. Jensen. **7**: 200(T)—1939; John Zeleny. **9**: 173—1941; Julius S. Miller. **10**: 162—1942; Waldemar Noll. **19**: 329(A)—1951
- Demonstration lecture, V. E. Eaton. **18**: 519(T)—1950
- Demonstration lecture—art or craft? V. E. Eaton. **16**: 58(T)—1948
- Demonstration lecture as an art: introductory remarks, R. M. Sutton. **18**: 519(T)—1950
- Demonstrations, W. N. St. Peter, R. C. Hitchcock, M. G. Zabetakis, W. C. Colwell, and C. O. Wiggs. **15**: 361(T)—1947
- Development of a lecture demonstration experiment, L. E. Dodd. **16**: 325(T)—1948
- Display project, I. V. Ragsdale. **9**: 194(A)—1941
- Education?—or merely training?! VIII, a demonstration that resolved a dilemma, George Forster. **19**: 195(A)—1951
- Educational demonstration program, Capt. W. B. Harris and Sgt. J. C. Joyce. **14**: 70(T)—1946
- Experiments, elementary demonstration, Eric M. Rogers. **12**: 239(A)—1944
- Four inexpensive lecture table experiments, Richard M. Sutton. **8**: 69(A)—1940
- Fourier components, demonstration of the meaning of, Agnes Townsend. **14**: 137(A)—1946
- Further remarks on demonstration experiments, Julius Sumner Miller. **20**: 184(L)—1952
- Gadgets used in simple demonstrations, R. L. Feldman. **17**: 391(T)—1949
- High school students, demonstration lecture for, O. Blackwood. **9**: 58(A)—1941
- Historic demonstrations, O. Oldenberg. **20**: 111—1952
- Independent measurement, demonstration of, Norman Campbell. **12**: 115(A)—1944
- Interesting exhibit, J. L. Ryerson. **17**: 520(L)—1949
- Laboratory demonstrations, P. L. Copeland, C. A. Culver, R. L. Dolecek, R. E. Harris, A. G. Hoyem, R. A. Nelson, C. R. Smith, E. R. Wightman, and R. C. Wyckoff. **8**: 201(T)—1940; P. L. Copeland, H. L. Cunningham, R. R. Hancox, J. Harty, R. E. Harris, W. J. Hooper, J. C. Jensen, A. F. Johnson, L. A. Rohret, and V. F. Swaim. **9**: 192(T)—1941
- Large-sized apparatus in lecture demonstrations in physics, W. H. Kadesch. **19**: 483(T)—1951
- Lecture-demonstrations, J. G. Black. **7**: 264(T)—1939
- Lecture demonstrations as a staff project, Homer L. Dodge. **4**: 51(T)—1936
- Lecture demonstrations in elementary physics, N. Henry Black. **2**: 91—1934
- Lecture-demonstrations (Recent publications and teaching aids). **6**: 340—1938
- Lecture experiments *versus* demonstrations, G. Wendt. **15**: 359(A)—1947
- Lecture room and its equipment, J. W. Buchta. **13**: 120(T)—1945
- Mobile demonstration laboratory of the Pennsylvania summer EDT program, Harold K. Schilling. **10**: 54(A)—1942
- New equipment, demonstration of, R. E. Harris. **17**: 459(T)—1949
- New equipment, demonstrations of some, John G. Moorhead. **10**: 211(T)—1942
- On classroom demonstrations, W. W. Robertson. **17**: 19—1949
- Outlines of lecture demonstrations, John A. Eldridge. **9**: 57(A)—1941
- Physics exhibits that have been given at Goucher College, M. K. Frehafer. **8**: 264(T)—1940
- Physics lecture room and its equipment, J. W. Buchta. **13**: 189—1945
- Place of lecture demonstrations in an elementary physics course, N. H. Black. **2**: 31(T)—1934

- Plan for developing a better technique in giving science demonstrations, Edith M. Selbert. **1**: 62(A)—1933
- Projection of small scale phenomena, Howard S. Seifert. **19**: 195(A)—1951
- Science on television. A demonstration, Edward R. Bascom. **19**: 485(T)—1951
- Selected experiments, demonstration of, A. E. Caswell and D. Hunter. **9**: 183(T)—1941
- Several lecture demonstrations, L. E. Dodd. **14**: 70(T)—1946
- Several simple demonstrations, Julius S. Miller. **9**: 312—1941
- Short demonstration experiments without words, Eric M. Rogers. **18**: 520(T)—1950
- Simple demonstration experiments, G. M. Koehl. **17**: 232(A)—1949
- Simple equipment, demonstrations with, Gordon M. Dunning. **19**: 482(A)—1951
- Simple television demonstration, Robert E. Benn. **17**: 437—1949
- Some effective lecture-room demonstrations, D. C. Miller. **2**: 31(T)—1934
- Some laboratory and demonstration aids, C. C. Kiplinger. **4**: 43—1936
- Some lecture demonstrations in elementary physics, W. S. Webb and J. Schroeder. **13**: 57(T)—1945
- Some simple demonstrations, E. C. Weaver. **12**: 181(A)—1944
- Some stepped-up lecture table experiments, Richard M. Sutton. **10**: 56(A), 141—1942
- Some useful demonstration apparatus, N. H. Black. **7**: 426(A)—1939
- Speaking of physics: simple demonstrations, G. M. Koehl. **16**: 324(T)—1948
- Steiner's theorem, model for the demonstration of, James T. Curtis. **15**: 93—1947
- Student exhibits. Arthur Matthias, Lester Zelle, Alfred Schwaneke, Barthold Bouricius, and Robert Jones. **16**: 366(T)—1948
- Television, demonstration lecture on, T. F. Joyce. **9**: 54(T)—1941
- Three demonstration experiments, Eric M. Rogers. **18**: 333(A)—1950
- Three inexpensive demonstration and laboratory aids, W. S. Drury. **7**: 205(A)—1939
- Three lecture demonstrations, Francis W. Sears. **19**: 329(A)—1951
- Three pieces of lecture room apparatus, demonstration of, Richard M. Sutton. **5**: 45(A)—1937
- Two demonstration devices, J. S. Miller. **8**: 330(A)—1940
- Two experiments in the building of plywood models to demonstrate surfaces, Norman Lapworth and L. E. Dodd. **7**: 262(A)—1939
- Two lecture demonstrations, W. W. Sleator. **19**: 486(A)—1951
- Two new exhibits, R. S. Clay. **7**: 269(A)—1939
- Two simple demonstrations and an application of physics in the home, A. D. Hummel. **9**: 55(A)—1941
- Unusual laboratory experiments and demonstrations developed at Texas Christian University, Newton Gaines. **16**: 363(T)—1948
- Use of public demonstration lectures to popularize physics, O. Blackwood. **8**: 139(T)—1940
- Uses of television techniques in demonstration apparatus, H. W. Fulbright. **18**: 334(A)—1950
- What remains twenty years after a demonstration, L. I. Bockstahler. **18**: 519(T)—1950

*Heat*

- Adiabatic expansion, formation of clouds, E. R. Pinkston. **15**: 432(T)—1947
- Boiling water at reduced pressure, demonstrating, R. C. Hitchcock. **13**: 126(T)—1945
- Boyle's law—Dalton's law problem solved with gauge pressures, M. D. Adams. **19**: 399(T)—1951
- Convection currents, E. J. Williams. **7**: 350(A)—1939
- Cooling effect of evaporation. A lecture demonstration, Alton L. Markley. **2**: 123(A)—1934
- Critical phenomena, demonstration of, Bruce H. Sage. **9**: 245(T)—1941; B. H. Sage and H. H. Reamer. **9**: 310—1941
- Cryophorus, dry ice with CO<sub>2</sub>, freezing by reducing pressure, R. A. Goodwin. **15**: 432(T)—1947
- Dalton's law of vapors, John Satterly. **13**: 50—1945
- Explosion by shock, yellow phosphorus and carbon disulfide, W. M. Smedley. **15**: 433(T)—1947
- Extension of a simple experiment designed to show the heat generated by a spark, Julius Sumner Miller. **17**: 447(L)—1949
- Fog production, demonstration of, J. J. Coop. **9**: 242—1941
- Freezing water by evaporation, Haym Kruglak and Paul M. Loofboro. **12**: 48—1944
- Gas law demonstration apparatus, F. C. Hickey. **13**: 58(A)—1945
- Gas laws simply demonstrated, Marvin J. Pryor. **13**: 421—1945
- Improved Franklin's flask and simplified cryophorus, Isay Balinkin. **1**: 55(T), 86—1933
- Improved heat of vaporization demonstration, V. R. Rawson. **8**: 270(A)—1940
- Kinetic molecular theory of gases, apparatus to demonstrate, L. de St. Paër. **8**: 330(A)—1940
- Kinetic theory, demonstration in, P. H. Miller, Jr. and Eugene L. Langberg. **10**: 20—1942
- Kirchhoff's law of radiation, demonstration of, Mario Iona, Jr. **15**: 196(A)—1947
- Lecture demonstrations of Boyle's law and of change of state, F. B. Dutton. **9**: 133(A)—1941
- Linear thermal expansion, demonstrating, using the catenary, Richard C. Hitchcock. **13**: 122(A); Richard C. Hitchcock and Mark W. Zemansky. **13**: 329—1945
- Production of liquid oxygen as a lecture table demonstration, Chas. T. Knipp. **2**: 184(A)—1934
- Projection thermometer, some demonstrations with, W. T. Scott and J. J. G. McCue. **20**: 394(A)—1952
- Refrigeration demonstration, E. F. Shumaker. **12**: 181(A)—1944

- Simple device for demonstrating relative specific heats, Paul R. Gleason and Clement L. Henshaw. 7: 262(A)—1939
- Simple thermocouple for demonstrating the properties of thermal radiation, C. W. Heaps. 5: 87—1937
- Thermal diffusion column, demonstration, B. B. McInteer and C. E. Schensted. 17: 417—1949
- Thermal diffusion, demonstration of, W. M. Spicer. 14: 278(A)—1946
- Triple point for water, demonstration of, Earland Ritchie. 20: 387(A)—1952
- Triple-point for water, lantern demonstration of, W. F. Powers. 4: 40—1936
- Two-dimensional kinetic theory model, Thomas B. Brown. 9: 58(A), 168—1941
- Vaporization of mercury, demonstration of, H. C. Froelich. 10: 273(A)—1942
- Visual demonstration of the evaporation of mercury, Wesley G. Leighton and Philip A. Leighton. 3: 94(A)—1935
- Light*
- Aberration in a convex spherical mirror, model to demonstrate, F. R. Hirsh, Jr. 14: 70(T)—1946
- Carpenters' rule: an optical instrument, Paul Kirkpatrick. 13: 116—1945
- Coarse diffraction gratings for lecture demonstration and laboratory, H. M. Reese and N. S. Gingrich. 14: 324—1946
- Color and color photography, demonstrations for, H. C. Colton. 13: 120(T)—1945
- Color demonstration apparatus, J. A. Van den Akker. 16: 1—1948
- Color demonstration with a small projection lantern, V. E. Eaton. 20: 465(A)—1952
- Color experiments with a lecture table lantern, V. E. Eaton. 7: 70(A)—1939
- Color illumination, demonstration of, T. L. Young. 13: 57(T)—1945
- Color mixing, a demonstration, Charles H. Skinner. 14: 276(T)—1946
- Color spectrograms for demonstration purposes, Hans H. Kretschmer. 13: 111—1945
- Complementary color photography, Everett F. Cox. 7: 70(A)—1939
- Demonstration monocular, Howard N. Maxwell. 20: 310—1952
- Device for showing object and image positions for a thin lens, Richard C. Hitchcock. 14: 138(A)—1946
- Diffraction of light, an experimental demonstration, F. A. Molby. 5: 78—1937
- Diffraction of light by supersonic waves in liquids; apparatus for demonstration and for an intermediate laboratory experiment, Alva W. Smith and Lewis M. Ewing. 8: 57—1940
- Dynamic demonstration of nitrogen afterglow, R. Stuart MacKay. 18: 319—1950
- Dynamical demonstration of  $f=R/2$  for a concave spherical mirror, Vernon L. Bollman. 18: 394(A); 400(L)—1950
- Elliptic mirror for lecture demonstration, J. Smithson and W. T. Fenhagen. 19: 442(T)—1951
- Emission and absorption of sodium vapor, demonstration of, F. Blaha. 19: 130(L)—1951
- Fluorescence demonstration, C. K. Christensen. 15: 361(T)—1947
- Fresnel diffraction demonstrated with a ripple tank, H. D. Rix. 18: 334(A)—1950
- Geometrical optics, apparatus for demonstrations in, K. H. Fried, E. H. Green, and W. H. Mais. 8: 43—1940
- Home-brewing the rainbow—and understanding it, Gaylord Johnson. 1: 93(A)—1933
- Image formation by a convex lens, demonstration of, Waldemar Noll. 17: 391(A)—1949
- Inexpensive apparatus for lecture and laboratory demonstrations in polarized light, Leighton B. Morse. 5: 221(T)—1937
- Interference figures, G. Ghey and J. S. Barlee. 14: 213(A)—1946
- Interference of light waves, demonstration of, Gordon M. Dunning. 19: 136(T)—1951
- Inversion of the retinal image, Leonard Eisner. 20: 308—1952
- Lantern slide color demonstration, Sheldon Brown. 17: 164(T)—1949
- Lecture room optical disk, H. E. Carr, W. T. Fenhagen, and J. R. Smithson. 18: 393(T)—1950
- Lens aberrations—a classroom demonstration, Arthur S. Jensen. 13: 113—1945
- Lens aberrations, classroom demonstration of, A. S. Johnson. 12: 241(T)—1944
- Long-wave fluorescence, demonstrating, H. D. Murray. 8: 142(A)—1940
- Luminescence, lecture demonstrations of, Charles W. Edwards. 10: 212(A)—1942
- Mechanical demonstrator for Fermat's principle, W. Cullen Moore. 18: 333(A)—1950; 19: 1—1951
- Model to demonstrate spherical aberration of a convex spherical mirror, F. R. Hirsh, Jr. 14: 66—1946
- Novel optical screen for classroom demonstrations, Joseph H. Howey. 1: 27(A)—1933
- On the pinhead shadow inversion phenomenon, F. R. Hirsh, Jr., and E. M. Thorndike. 12: 164—1944
- Optical instruments, demonstration of, Mario Iona, Jr. 14: 64—1946
- Phase contrast principle, demonstrating, J. Elmer Rhodes, Jr. 17: 70—1949
- Phase difference between ordinary and extraordinary beams, demonstrations of, J. G. Winans. 19: 398(T)—1951
- Physical phases of fluorescent lamps, with demonstrations, J. C. Garman. 9: 183(T)—1941
- Pohl's interference experiment, demonstration of, Mark W. Zemansky. 17: 232(A)—1949
- Principles of interference, demonstrating, Harald Perlitz. 4: 140—1936
- Principles of interference, method of demonstrating, Charles E. Miller. 3: 75—1935



- Projection of thin-film interference fringes, Thomas B. Brown. **10**: 55(A)—1942
- Refraction of light at a boundary between two media of different indices of refraction, model to demonstrate, F. R. Hirsh, Jr. **16**: 57(T)—1948
- Research on natural illumination in school rooms, demonstration of, R. A. Boyd. **19**: 136(T)—1951
- Shadow projection lamp for electroscope and radiometer, J. G. Black. **1**: 15, 21(T)—1933
- Simple color demonstration, Hugh F. Henry. **15**: 361(A)—1947
- Simple polarized light demonstration, Charles A. Fowler. **19**: 398(A)—1951
- Simple telephotophone for communication on a beam of light, Richard M. Sutton. **2**: 173—1934
- Simplified and compact tricolor mixing device, Calvin N. Warfield. **6**: 211—1938
- Some demonstration experiments in light, John Zeleny. **10**: 116—1942
- Some demonstrations with polarized light, Francis T. Jones. **8**: 325(T)—1940
- Spherical aberration of a concave spherical mirror, model to demonstrate, F. R. Hirsh, Jr. **13**: 267—1945
- Stroboscope, demonstrations with, John S. O'Connor. **7**: 263(T)—1939
- Stroboscopic demonstration and high speed motion pictures, Newell S. Gingrich. **6**: 166(T)—1938
- Study of light, demonstrations in, Ralph Loring. **17**: 459(T)—1949
- Synthetic rutile, Wilson W. Woodcock, Jr. **19**: 323(L)—1951
- Techniques for demonstrating color phenomena, Isay A. Balinkin. **17**: 231(T)—1949
- Ultraviolet spectrum, lecture-demonstration of, R. Rollefson. **7**: 259—1939
- Use of a suspension of scattering particles as optical analyzer, J. K. Robertson. **7**: 259—1939; Erratum. **7**: 429—1939
- Use of color and illumination in physics lecture demonstrations; M. W. White. **12**: 179(T)—1944
- Water prisms and a ray-tracing device for demonstrations in optics, Ting Supao. **16**: 52—1948

#### *Magnetism*

- Chladni plates by magnetostriction, E. R. Pinkston. **15**: 432(T)—1947
- Demonstrating the diamagnetism and paramagnetism of liquids, R. E. Vollrath. **16**: 155—1948
- Effect of area of contact on the tractive effort of a magnet, Simon Sonkin. **6**: 104—1938
- Ferromagnetic action, model of, R. M. Bozorth and J. F. Dillinger. **5**: 157—1937
- Lecture demonstration for the three types of magnetic substances, R. E. Trumble, Jr. **18**: 393(T)—1950
- Magnetic amplifiers demonstration, W. E. Sargeant. **17**: 460(T)—1949
- Magnetic field inside a current-carrying conductor, demonstration of, Mario Iona, Jr., and John P. Karbler. **16**: 121(A)—1948
- Magnetic heat-motor, John Mills. **5**: 40—1937
- Magnetized ring, demonstration experiment, Eric M. Rogers. **14**: 273—1946
- Magnetostriction, demonstration unit for, Jun Hino and George Sandoz. **18**: 515—1950
- Model of magnetization, F. W. Warburton. **4**: 213—1936
- Models to illustrate gyromagnetic and electron-inertia effects, S. J. Barnett. **5**: 1—1937
- Precession of a magnetic top, George T. Rado. **12**: 29—1944
- Rotating magnetic field, demonstrating, J. J. Coop. **6**: 37—1938

#### *Mechanics*

- Acceleration, demonstrations of, H. Rees Mitchell. **18**: 516—1950
- Advanced dynamics, demonstration laboratory for, D. A. Wells. **13**: 147—1945
- Banked curves, demonstration of, Everett Haynes. **17**: 93(A)—1949
- Center of gravity, demonstration of, moment of inertia and the period of a compound pendulum, W. B. Pietenpol. **8**: 70(A)—1940
- Centrifugal force with sound effects (demonstration), M. D. Adams. **19**: 399(T)—1951
- Classical experiment illustrating the notion of "jerk," P. LeCorbeiller. **13**: 56(A)—1945
- Classical problem in analytical mechanics, Julius Sumner Miller. **20**: 455(L)—1952
- Coefficients of friction greater than unity, B. W. Bartlett. **12**: 48—1944
- Complete physics course through electric trains, Harry Peach. **20**: 314(L)—1952
- Conservation of energy, demonstration of, T. J. Blisard and C. H. Duursema. **20**: 400(A)—1952
- Coriolis force, simple demonstration of, Arthur A. Klebba and Henry Stommel. **19**: 247—1951
- Demonstration gyroscope, V. E. Eaton. **18**: 334(A)—1950
- Device for demonstrating constancy of angular momentum, Mason E. Hufford. **13**: 417—1945
- Elastic impacts, demonstration of, R. M. Bell. **15**: 163(T)—1947
- Equilibrium of a rectangular body resting on a cylinder, demonstration of, Virgil M. Hutchison and Harry Hill. **15**: 190—1947
- Euler's angles, demonstration of, L. Horn. **17**: 460(T)—1949
- Experiment demonstration to determine rifle bullet velocity, Donald Worth. **19**: 250(A)—1951
- Experiment to demonstrate a paradox of rotation, Richard M. Sutton. **4**: 49(T)—1936
- Experimental examples in dynamics, Carl A. Ludeke. **9**: 162—1941
- Foucault pendulum, demonstration, M. J. W. Phillips. **10**: 217(A)—1942
- Gyroscopes—a demonstration lecture, Jarvis Todd. **10**: 165(T)—1942
- Impact ball apparatus, some interesting aspects of, Seville Chapman. **9**: 357—1941

- Inertia, demonstration of, Roger M. Morrow. 11: 351—1943
- Inertial significance of mass and the conservation of momentum, two experiments to demonstrate, Austin J. O'Leary. 14: 120; Erratum. 14: 214—1946
- Intermediate mechanics, some demonstrations in, Mario Iona, Jr. 14: 139(A)—1946
- Large, low speed gyroscope, demonstrations with, Harold K. Schilling. 14: 116; 14: 136(T)—1946
- Large-scale demonstration of the flight of projectiles, Gilbert Henry. 10: 202—1942
- Larger gyroscope, George P. Unseld. 14: 274—1946
- Law of inertia, experiment on, W. V. Burg. 12: 181(A)—1944
- Lecture demonstration of law of conservation of mass, Irving A. Cowperthwaite. 5: 224—1937
- Lecture on momentum, experiments for, Richard T. Cox. 17: 391(T)—1949
- Lecture-room measurement of the value of  $g$ , Bela G. Kolossvary. 20: 312(L)—1952
- Mach law of inertia, experiments to demonstrate, Austin J. O'Leary. 15: 196(T)—1947
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 Radiocarbon the historian, A. J. Kozora. **20**: 598(A)—1952  
 Reproductions from the Manchester Town Hall, E. C. Watson. **9**: 111—1941  
 Sidelights on the era of Young and Fresnel, E. L. Nichols. **1**: 61(A)—1933  
 Sixteenth century spectacle shop, E. C. Watson. **20**: 578—1952  
 Rocket practice in the marshes, 1845, E. C. Watson. **12**: 366—1944  
 The *Tribuna di Galileo* in Florence, E. C. Watson. **9**: 184, 246(A)—1941  
 Trinity College, Cambridge, at the time of Newton, E. C. Watson. **6**: 319—1938  
 Twenty-five years of American physics, Karl K. Darrow. **17**: 127—1949

#### **Industrial and Governmental Research**

##### *Governmental Agencies*

- Argonne Laboratory, R. L. Purbrick. **16**: 325(T)—1948  
 Bureau of Standards, work in electricity and radio, E. C. Crittenden. **2**: 186(A)—1934  
 Bureau of Standards, work in light and heat, Clarence A. Skinner. **2**: 79(A)—1934  
 Meteorological station at Brookhaven National Laboratory. **16**: 413—1948  
 National Bureau of Standards, George K. Burgess. **1**: 60(A)—1933  
 National Bureau of Standards, work in metrology and mechanics, Lyman J. Briggs. **1**: 127(A)—1933  
 Oak Ridge National Laboratory, A. M. Weinberg. **17**: 391(T)—1949  
 On the physicist in the government service, E. O. Hulburt. **7**: 157—1939  
 On the research work of the U. S. Weather Bureau, W. J. Humphreys. **1**: 126(A)—1933  
 Opportunities for the physicist in the government service, E. C. Crittenden. **7**: 148—1939  
 Physicist in the Coast and Geodetic Survey, Herbert Grove Dorsey. **7**: 152—1939  
 Physicist in the government service—a symposium, E. C. Crittenden, H. G. Dorsey, E. O. Hulburt, and C. H. Kunsman. **7**: 67(T)—1939  
 Physics at Naval Proving Grounds, R. R. Dempster. **13**: 57(T)—1945

Research and Development Board, Henry M. O'Bryan. 16: 362(T)—1948  
 Research and development in the War Department, H. S. Aurand. 15: 195(T)—1947  
 Research for Civil Aeronautics Authority, M. O'Day. 8: 139(T)—1940  
 Research programs of the Office of Naval Research in the physical sciences, P. F. Lee. 15: 195(T)—1947  
 Scientist and government research, Eric A. Walker. 17: 30—1949  
 University scientists and government research laboratories, Frank P. Graham. 16: 361(T)—1948

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Adventure in research: copper-oxide rectifiers and their applications, L. O. Grondahl. 4: 105—1936  
 Applications of spectroscopy to the oil industry, J. Rud Nielsen. 10: 57(T)—1942  
 Atomic energy—relationships to industrial research, Robert F. Bacher. 16: 355(A)—1948  
 Automatic weather station. 16: 485—1948  
 Electronics and industry, A. D. Hummell. 5: 21(T)—1937  
 Engineer as a physicist, D. M. Bennett. 5: 21(T)—1939  
 Gasoline for the physicist, P. D. Foote. 8: 201(T)—1940  
 Gasoline from the point of view of the physicist, Paul D. Foote. 8: 264(T)—1940  
 Geophysics in the oil industry, Charles P. Bazanni. 19: 251(T)—1951  
 Industrial applications of the spectrograph, R. P. Sawyer. 9: 192(T)—1941  
 Industry and science, Charles F. Kettering. 8: 266(T)—1940  
 Industry's quarrel with physics. 7: 350(A)—1939  
 Needs in research, G. P. Harnwell. 11: 233(T)—1943  
 Nuclear industry, metallurgical problems in, John H. Frye, Jr. 19: 486(T)—1951  
 Oil well logging, Harley J. Haden. 18: 394(A)—1950  
 Oil well logging—an opportune field for the physicist, Harley J. Haden. 17: 368—1949  
 Outlook for the physicist and prospective physicist in industry, Albert W. Hull. 12: 62—1944  
 Physical problems in the textile industry, K. L. Hertel. 8: 264(T)—1940  
 Physicist and the future development of atomic energy, Robert F. Bacher. 16: 326—1948  
 Physicist in industry, Arthur C. Hardy. 8: 285—1940  
 Physics in industry, J. H. Graham. 5: 21(T)—1937; R. B. Barnes. 11: 233(T)—1943; C. G. Suits. 18: 55—1950  
 Quality control by statistical methods: a field for physicists, Ralph Hoyt Bacon. 12: 157—1944  
 Requirements on industrial physicists, G. E. Ziegler. 11: 232(T)—1943  
 Some considerations of an employer hiring physicists for applied research, Seville Chapman. 20: 142, 324(T)—1952

Some experiences in government and industrial research, J. G. Black. 16: 324(T), 365(T)—1948  
 Uses of the electron microscope in engineering, Oliver Row. 18: 526(T)—1950

### *Training for Research*

Available industrial fellowships. 6: 47—1938  
 Chemical industry, training of physicists for, R. C. L. Bosworth. 12: 309(A)—1944  
 Education of physicists for industry, J. T. Littleton. 11: 316—1943  
 Educational training for physicists, J. T. Littleton. 15: 339—1947  
 Facilities for physics students in industry during vacation. 7: 78(A)—1939  
 Government research scientists, graduate level laboratory training for, George Abraham. 19: 487(A)—1951  
 Industrial experience for science students. 11: 235(A)—1943  
 Industry, training of physicists for, W. Weniger and W. E. Forsythe. 8: 325(T)—1940  
 Influence of war research on the postwar physics curriculum, Brian O'Brien. 12: 238(T)—1944  
 Naval Research Laboratory, training needed for work in, R. P. Briscoe. 10: 160—1942  
 Opportunities in and training for industrial optics, Allen E. Parker. 12: 180(T)—1944  
 Research physicist—his characteristics and training, Ross Gunn. 10: 181—1942  
 Scientific training in the Bureau of Ships, A. W. Anderson. 17: 461(A)—1949  
 Selection and training of students for industrial research, Albert W. Hull. 13: 269(A)—1945  
 Small industrial research laboratory, training for, H. L. Mason. 12: 346—1944  
 War research, training physicists for, F. W. Loomis. 11: 112(T)—1943

### **Laboratory Arts and Techniques**

#### *Equipment*

Adaptation of war surplus equipment to laboratory use, Frank P. Goeder and Louis R. Weber. 18: 333(A)—1950  
 Adjustable stopcock remover, R. W. Westerman. 1: 56(A)—1933  
 Air pressure for blast lamps, G. W. Thiessen and J. E. Wertz. 1: 90(A)—1933  
 Apparatus for filling large closed-end manometers, Angus E. Cameron. 2: 38(A)—1934  
 Application of a thyratron to induction coils, L. C. Verman. 3: 141(A)—1935  
 Convenient and practical cork borer appliance, R. E. Dunbar. 1: 56(A)—1933  
 Diffraction gratings at low cost, Warner W. Schultz. 12: 105—1944  
 Electric radiant heater as an aid in electrostatic experiments, W. P. Westphal. 1: 93(A)—1933  
 Ground glass junctions, Harlan L. Baumbach. 2: 37(A)—1934



Improved laboratory screw clamp, W. A. Sperry. 1: 90(A)—1933  
 Inexpensive apparatus, Clarence C. Vernon. 1: 57(A)—1933  
 Jig for bending copper tubing. 1: 91(A)—1933  
 Laboratory cooling unit, D. H. Cook. 1: 90(A)—1933  
 Laboratory uses for pyrex glass welds to metals, Byron E. Cohn. 5: 221(A)—1937  
 New use for burnt-out electric lamp bulbs, G. T. P. Tarrant. 3: 197(A)—1935  
 Protective device for the synchronous clock, W. H. Michener and Chas. Williamson. 8: 63—1940  
 Rubber stoppers, N. W. Matthews. 4: 55(A)—1936  
 Safeguards on laboratory apparatus, C. J. Overbeck. 14: 320—1946  
 Screening tube for electrometer leads, A. J. Davies. 1: 56(A)—1933  
 Simple pump for inflating balloons, Richard M. Sutton. 2: 185(A)—1934  
 Some laboratory and demonstration aids, C. C. Kiplinger. 4: 43—1936  
 Transparent clips on scales, L. Elson. 16: 253(A)—1948  
 Use of a dial gauge in the elementary laboratory, L. A. Sanderman. 8: 259—1940  
 Use of the high intensity mercury vapor lamp, Winthrop R. Wright. 5: 229—1937  
 Wide range motor speed control, O. H. Schmitt. 7: 77(A)—1939

#### *Maintenance and Repair*

Cleaning benches, W. A. Becker. 9: 133(A)—1941  
 Cleaning fine copper wire, D. Bell. 10: 217(A)—1942  
 Cleaning resistance box plugs, John Harty. 9: 50—1941  
 Cleaning sodium metal, E. B. Wilson. 1: 123(A)—1933  
 Collecting spilled mercury, C. V. Boys. 2: 184(A)—1934  
 Collection of spilled mercury, A. F. McGuinn. 14: 142(A)—1946  
 Cross-hairs, D. B. Pheley. 16: 58(T)—1948  
 Laboratory suggestion, M. J. McHenry. 1: 57(A)—1933  
 Note on the filling of manometers, M. Q. Doja. 1: 124(A)—1933  
 Protecting labels from moisture. 1: 57(A)—1933  
 Protecting tools and instruments from rust. 1: 124(A)—1933  
 Purification of mercury, M. Zuppke. 1: 93(A)—1933  
 Rebuilding old storage batteries, Raymond Bavkuloo. 2: 124(A)—1934  
 Remagnetizing permanent magnets, H. F. Boulind and L. C. Davisson. 14: 277(A)—1946  
 Removing welding-torch tips, Hallie P. Davidson. 1: 91(A)—1933  
 Repairing broken mercury columns in thermometers, J. R. Endsley. 1: 92(A)—1933  
 Sharpening your lathe tools, W. Clyde Lammey. 1: 124(A)—1933

Simple method of fitting fine cross-wires in an optical instrument, D. G. Drummond. 1: 124(A)—1933  
 Small optics shop, G. G. Kretschmar. 7: 332—1939  
 Solution for preventing rust. 1: 57(A)—1933  
 Tricks of sharpening knives and other straightedged tools, W. Clyde Lammey. 1: 91(A)—1953  
 Unscrewing lens mount, D. A. Cameron. 11: 108(A)—1943

#### *Manipulation*

Adjustment of a Michelson interferometer for equal light paths, Willoughby M. Cady. 6: 277—1938  
 Connecting many wires to one terminal, H. Hartridge. 16: 253(A)—1948  
 Drilling and tapping Bakelite. 7: 78(A)—1939  
 Convenient and effective method of charging electroscopes, J. A. Culler. 2: 76—1934  
 Electroplating with lead, zinc, and cadmium, C. A. Crowley. 1: 125(A)—1933  
 Explosion hazard in coating mirrors, James C. Rice. 2: 123(A)—1934  
 Growing piezoelectric crystals, Albert C. Walker. 19: 251(T)—1951  
 Hints on silvering glass, F. E. J. Cockenden. 6: 345(A)—1938  
 Laboratory techniques for seniors in physics, K. E. Fitzsimmons. 18: 524(A)—1950  
 Lantern slides of crystals, Harriett H. Fillinger. 10: 336(A)—1942  
 Lost arts of the physicist, R. A. Loring. 15: 360(T)—1947  
 Method for changing the response of a system, Edward P. Clancy. 19: 190(L)—1951  
 Method of ruling equidistant parallel lines, Clark Wertenbaker. 13: 51—1945  
 Note on cathode sputtering, F. H. Newman. 1: 27(A)—1933  
 Preparing rods for stroking in the Kundt's tube experiment, Bernard L. Brinker. 18: 526(A), 579(L)—1950  
 Production and measurement of air bubbles in water, C. H. Tindal and D. C. Whitmarsh. 16: 123(A), 300—1948  
 Rapid filtration of viscous liquids, E. B. Moss. 3: 46(A)—1935  
 Separation of isotopes—a survey, Dean E. Wooldridge. 6: 171—1938  
 Simple method for fastening a rubber membrane to a glass bell, Chi-Ching Tsai. 18: 233—1950  
 Simple method of constructing glass cells, L. W. Mullinger. 9: 197(A)—1941  
 Simple method of making ice in the laboratory, H. G. Dorsey. 16: 324(T)—1948  
 Simplifying electrical connections, J. W. Davis. 9: 133(A)—1941  
 Spreading monomolecular films, B. Vonnegut. 11: 356(A)—1943  
 System of electrical connections for experimental work, Benjamin L. Snavely. 16: 123(A)—1948

Vacuum technic: speed of pumping and molecular flow, Lyman G. Parratt. **7**: 207—1939

Working in glass, Raymond Barkuloo. **2**: 39(A)—1934

#### *Materials*

Cements for modeling purposes. **2**: 39(A)—1934

How to make fireproof cement, W. Clyde Lammey. **1**: 56(A)—1933

Improved stopcock grease, L. C. Case. **4**: 55(A)—1936

Soluble anhydrite: a universal desiccant, G. Fowles. **10**: 61(A)—1942

Use of polystyrene to improve electrostatic equipment, A. R. Reed. **17**: 391(A)—1949

Waterproof glass and metal cement. **1**: 57(A)—1933

#### *Testing*

Applications of ultrasonic pulse techniques in research and testing, Julian Frederick. **19**: 486(T)—1951

Improvement of dew-point determination, J. A. Van den Akker and Wilmer A. Wink. **11**: 300(A)—1943

Interferometer methods applied to two-dimensional flows, W. M. Coates. **15**: 432(T)—1947

Measurement of ultrashort time intervals, S. H. Neddemeyer. **15**: 432(T)—1947

New measurement techniques for old experiments, Noel C. Little. **3**: 44(T)—1935

Nondestructive testing of manufactured parts, G. P. Brewington. **19**: 136(T)—1951

Observation of reflecting galvanometer deflections, R. V. Jones. **3**: 46(A)—1935

Quick determination of a dry cell condition, K. W. Saunders. **18**: 392(T)—1950

Use of WWV signals to time pendulums, J. T. McCarthy. **18**: 306—1950

Weighing living marine animals, H. A. F. Gohar. **9**: 318(A)—1941

### **Laboratory Organization and Operation**

#### *Advanced Laboratories*

Celestial laboratories, D. V. Guthrie. **10**: 211(T)—1942

Demonstration laboratory for advanced dynamics, D. A. Wells. **13**: 147—1945

Design and performance of a liquid-air plant, Arthur Ruark and N. Di Costanzo. **8**: 265(A)—1940

Flying laboratory, A. A. Knowlton. **6**: 166(T), 238(T)—1938

Infra-red laboratory, C. E. Leberknight. **6**: 40(T)—1938

Mass production in the elementary electronics laboratory, B. W. Bartlett, P. M. Honnell, and F. H. Mitchell. **16**: 224—1948

Modern physics, elementary laboratory in, Joseph W. Straley, Karl H. Fussler, and Paul E. Shearin. **19**: 313—1951

Modern physics laboratory, L. D. Huff. **16**: 362(A)—1948

New electronics laboratory at the California Institute of Technology, W. H. Pickering and H. V. Neher. **8**: 325(A)—1940

Original records of experimental work, E. L. d'Ouille. **16**: 254(T)—1948

Reproduction techniques for reports and information service, B. H. Weil and J. C. Lane. **16**: 254(T)—1948

Research records in the small laboratory, F. L. Jones. **16**: 254(T)—1948

Small optics shop as an aid in conducting an intermediate laboratory course in optics, G. G. Kretschmar. **6**: 284(A)—1938

Use of punched card techniques in the coding of inorganic compounds, J. C. Bailar, Jr., K. F. Heumann, and E. J. Seiferle. **16**: 254(T)—1948

#### *Apparatus*

Accessories for portable spectrosopes and spectrometers used in undergraduate instruction, A. N. Lucian. **2**: 168—1934

Appropriate components in general physics laboratory experiments, Louis R. Weber. **16**: 123(A)—1948

Choice and design of educational apparatus for the general physics laboratory, W. L. Kennon. **4**: 50(A)—1936

Laboratory electric services, C. E. Howe. **13**: 120(T)—1945

Laboratory electric services for the undergraduate physics laboratory, Carl E. Howe. **13**: 192—1945

Method of handling elementary laboratory apparatus, Sanford C. Gladden. **5**: 283—1937

New developments in apparatus for the elementary laboratory, O. H. Blackwood and E. Hutchisson. **1**: 41—1933

On the choice, design and construction of apparatus for large laboratory classes, W. L. Kennon. **16**: 362(T)—1948

Radio units for the laboratory, Paul A. Northrop. **7**: 42—1939

Safeguards on laboratory apparatus, C. J. Overbeck. **14**: 138(A)—1946

#### *Elementary Laboratories*

Elementary laboratory for premedical students, Nora M. Mohler, Lilly Lorentz, and Elizabeth T. Bunce. **19**: 170—1951

Elementary physics laboratory at Louisiana State University, T. N. Hatfield. **6**: 168(A)—1938

Experimental outcomes of laboratory instruction in elementary college physics, Haym Kruglak. **20**: 136—1952

Factors determining teaching effectiveness in the elementary laboratory, T. W. Lashof and M. E. Hoehne. **16**: 412(A)—1948

General physics laboratory (Recent publications). **8**: 267—1940

Laboratory in elementary physics, I. Walerstein. **19**: 196(T)—1951

Laboratory in the arts course, Francis I. Brady. **7**: 263(T)—1939

- Laboratory round table, Willard J. Poppy, Penrose S. Albright, L. B. Ham, Frank Verbrugge, Louis R. Weber, R. L. Edwards, and O. H. Smith. **18**: 462(T)—1950
- Laboratory work in the general physics course for engineering students, Philo F. Hammond. **5**: 221(T), 232—1937
- Special science laboratory for nonscience education, Erna M. J. Herrey. **17**: 233(A)—1949
- Survey of general physics laboratories in the United States, Sanborn C. Brown. **20**: 464(T)—1952

#### *Experiments*

- Criteria for choosing laboratory experiments, G. E. Owen. **19**: 381—1951
- Fundamental problems of experimental physics, James Hough. **19**: 489—1951
- Laboratory guide for statics and dynamics, Earland Richie. **19**: 250(T)—1951
- Nuclear emulsion technique, laboratory exercise in, R. A. Peck, Jr., and Paul Stelson. **19**: 48—1951
- Radiation physics, laboratory experiments for, C. M. Ziemann. **19**: 399(T)—1951
- Short laboratory manuals are efficient, Harry Peach. **20**: 54(L)—1952
- Up-to-date experiments for the laboratory, Louis R. Weber. **10**: 58(A)—1942

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- Case reports on accomplishment in laboratory instruction, J. C. Stearns, R. D. Spangler, L. B. Ham, J. L. Hundley, and R. H. Mortimore. **9**: 193(T)—1941
- Laboratory experiences, W. R. Varner. **12**: 240(T)—1944
- Laboratory ideas, H. L. Esterly. **12**: 240(T)—1944
- Laboratory instruction, Glenn F. Rouse. **8**: 264(T)—1940
- Physics instructor in the laboratory, Louis R. Weber. **18**: 335(A)—1950
- Some musings of an ex-lab instructor, F. A. Molby. **18**: 525(A)—1950

#### *Objectives*

- Aim of laboratory experiments for liberal arts students, Eric M. Rogers. **15**: 80—1947
- Aims and methods in the introductory laboratory, V. E. Eaton. **5**: 47(A)—1937
- Aims of the laboratory, M. Kostick. **8**: 331(A)—1940
- Attempt to make the elementary laboratory a more effective scientific experience, Glen F. Pippert and Duane Roller. **20**: 467(A)—1952
- Behavior objectives for laboratory instruction, Haym Kruglak. **19**: 223—1951
- Exercise of student originality in the general physics laboratory, M. H. Trytten. **3**: 192—1935
- Increasing the effectiveness of laboratory work, Francis D. Curtis. **12**: 181(A)—1944
- Laboratory investigation *versus* laboratory verification, C. R. Fountain. **1**: 21(T)—1933; **2**: 177—1934
- Laboratory objectives, E. H. Collins. **12**: 240(T)—1944
- Laboratory thoughts, J. C. Garman. **12**: 240(T)—1944

- Laboratory work and the scientific method, W. B. Thomas. **12**: 53(A)—1944
- Make laboratory experiments more practical, C. R. Fountain. **4**: 51(A)—1936
- Object of laboratory experiments in physics for liberal arts students, Eric M. Rogers. **14**: 137(A)—1946
- Role of laboratory work in the early years of the engineering curriculum, Miles J. Martin. **10**: 98—1942
- Some contributions the physics laboratory can make to general education, Gwilym E. Owen. **17**: 233(A), 270—1949

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- Adapted demonstration method of laboratory instruction, E. C. McCracken. **6**: 43(A)—1938
- Approach for introducing the characteristics of measurement, L. E. Dodd. **6**: 284(A)—1938
- Can a one-hour laboratory be made worthwhile? John S. Rinehart. **10**: 54(A)—1942
- Comparison of the effectiveness of the demonstration method and of individual laboratory work in the teaching of physics in secondary schools, Julian M. Blair. **5**: 221(A)—1937
- Cook-book laboratory work, A. A. Bless. **1**: 88—1933
- Departure in general physics laboratory procedure, Julius Sumner Miller. **19**: 190(L)—1951
- Even-front laboratory in the general course, Winthrop R. Wright. **9**: 56(A)—1941
- Experiment in laboratory instruction, Robert E. Berger. **7**: 398—1939
- Experimenting with experiments, Louise S. McDowell. **8**: 67(A)—1940
- Laboratory experiment as a "project," R. A. Goodwin. **16**: 324(T)—1948
- Most satisfactory type of requirement for the laboratory report, J. C. Stearns, C. N. Wall, R. Morrow, H. E. Hammond, and L. T. Earls. **9**: 193(T)—1941
- One-hour laboratory periods in general physics, W. Weniger. **5**: 62—1937
- Opportunistic physics laboratory, John A. Eldridge. **7**: 69(A)—1939
- Opportunity in the laboratory, J. A. Eldridge. **8**: 201(T)—1940
- Practical laboratory experience, Richard D. Murphy. **19**: 384(L)—1951
- Project approach for the general physics laboratory, Burton Henke. **20**: 389(A)—1952
- Projects in electrical laboratory, Charles Williamson. **20**: 108—1952
- Projects in electricity laboratory, Charles Williamson. **19**: 482(A); 486(A)—1951
- Semantic approach to the general physics laboratory, Andrew Longacre. **17**: 413—1949
- Single-period laboratory, a demonstrated success, H. C. Krenerick. **3**: 144(A)—1935
- Student laboratory projects, Harry Hill. **13**: 265(T)—1945
- Variations in the conventional physics laboratory to increase its appeal for premedical students, Clyde B. Crawley. **8**: 265(A)—1940



*Student Opinion*

- Student likes and dislikes in the elementary laboratory, John S. Rinehart. **9**: 56(A), 218—1941
- Student opinion as used at University of Southern California to improve physics laboratory instruction, W. Geer. **16**: 325(T)—1948
- Student opinion of laboratory experiments, C. J. Overbeck. **6**: 141—1938
- Student opinion of the first-year college physics laboratory experiments, C. J. Overbeck. **6**: 41(A)—1938
- Student questionnaires as an aid to laboratory teaching techniques, Willard Geer. **19**: 564—1951

*Testing and Grading*

- General college physics, laboratory examination for, W. H. Kinsey and R. A. Rhodes, II. **18**: 519(A)—1950; **19**: 246—1951
- Laboratory performance tests at the University of Minnesota, C. N. Wall, H. Kruglak, and L. E. H. Trainor. **19**: 546—1951
- Laboratory practical, Carl E. Adams. **20**: 184(L)—1952
- Laboratory "practical," Ruth Fitzmayer. **15**: 360(T)—1947
- Laboratory tests, Benjamin H. Wender. **19**: 438(L)—1951
- Method of grading laboratory work in physics in colleges, C. L. Rich. **16**: 365(T)—1948
- Pre-laboratory quiz, C. J. Overbeck. **12**: 110(A)—1944

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- American prose, Henry A. Perkins. **17**: 398(L)—1949
- Causality, relativity, and language, Elihu Fein. **19**: 211, 439(L), 566(L); Raymond J. Munick. **19**: 438(L)—1951
- Effective presentation of papers at meetings, R. D. Potter. **11**: 52(A)—1943
- Electric circuit equivalent of a sentence, John Mills. **13**: 406—1945
- English composition and American prose, John Satterly. **17**: 167(L)—1949
- Foreign language for the physics student, G. K. Schoepfle. **18**: 464—1950
- Foreign language for the undergraduate, G. K. Schoepfle. **18**: 335(A)—1950
- Forensic expertness in science, Wilmer Souder. **20**: 391(T)—1952
- General semantics and the science teacher, Wendell Johnson. **15**: 154—1947
- General semantics and the teaching of physics, Alvin M. Weinberg. **7**: 104—1939
- Giving power to words, Philip W. Swain. **13**: 120(T), 318—1945
- Glossary of German-English equivalents relating to atomic structure, Austin M. Patterson and H. V. Knorr. **1**: 82—1933
- Horrid words in physics, Foster Strong. **17**: 164(T)—1949

- Lines inspired by the article "Modern Terminology for Physics," Ira Freeman. **16**: 464—1948
- Linguistic skill of students, effect of multiple-response quizzes on, Julius Sumner Miller. **20**: 467(A)—1952
- Multa verba dele*, John Mills. **13**: 120(T)—1945
- Names of physical concepts, Parry Moon. **10**: 134—1942
- Nomenclature. **9**: 192(T)—1941
- Phrasing of the principle of indefiniteness, K. K. Darrow. **9**: 49(T)—1941
- Physics and good English, J. D. Elder. **13**: 56(T)—1945
- Physics as a source of metaphors, Walter D. O'Connell. **20**: 194(A)—1952
- Pronunciation of *electricity*, William Fuller Brown, Jr. **18**: 114(L)—1950
- Pronunciation of physical terms, J. S. V. Allen. **15**: 361(T)—1947
- Responsibility of the physics teacher for the student's facility in English prose, Pearl I. Young. **16**: 364(A)—1948
- Responsibility of the teacher of college physics for the student's facility in American prose, Pearl I. Young. **16**: 425—1948
- Student's facility in American prose, H. David Rix. **17**: 90(L); Pearl I. Young. **17**: 90(L)—1949
- Technical writing, Duane Roller. **13**: 174(T)—1945
- Technical writing and editing: source literature; elementary textbooks, Duane Roller. **13**: 99—1945
- World language, R. Gregory. **11**: 116(A)—1943

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- Few engaging aspects of current work in optics, Edwin H. Land. **20**: 394(T)—1952
- Infrared signaling, W. P. Cunningham. **15**: 432(T)—1947
- Optical and physical defects of high explosives, R. W. Wood. **4**: 48(T)—1936
- Optical methods for the determination of flame temperatures, S. S. Penner. Part I. Two-color and line-reversal techniques, **17**: 422; Part II. Reversal methods for nonisothermal flames, two-path method, compensated hot-wire method, methods based on measurement of line intensities, **17**: 491—1949
- Optics of headlights, J. H. Nelson. **7**: 78(A)—1939
- Photoconductivity, J. J. Brady. **7**: 201(T)—1939
- Photoconductivity in crystals, A. L. Hughes. **4**: 48(T)—1936
- Photoelasticity and photoplasticity, M. Hetenyi. **20**: 323(A)—1952
- Photosensitive glass, Karlem Riess, Walter C. Bosch, and T. Todd Reboul. **16**: 399—1948
- Role of physical optics in research, J. K. Robertson. **11**: 264—1943
- Some optical properties of paper, George R. Sears. **17**: 335(T)—1949

*Color*

- Color demonstration apparatus, J. A. Van den Akker. **16**: 1—1948

- Color effect of fluorescent lighting, George E. Hauver. 17: 446(L)—1949
- Color in the world around us, Karl F. Herzfeld. 8: 264(T)—1940
- Color mixers, John Zeleny. 4: 100—1936
- Color perception and color deficiencies, Z. V. Harvalik. 18: 462(T)—1950
- Color spectrograms for demonstration purposes, Hans H. Kretschmer. 13: 111—1945
- Color terminology. 9: 317(A)—1941
- Colored motion photomicrography of the formation of crystals in polarized light, Kent H. Bracewell. 5: 226—1937
- Colorimetry and its applications, H. M. Sullivan. 19: 384(T)—1951
- Demonstrations for color and color photography, H. C. Colton. 13: 120(T)—1945
- Fundamentals of colorimetry, Donald J. Lovell. 17: 233(A)—1949
- Laboratory exercises on examining colors, A. Dmochowski. 4: 141—1936
- Light, color, and illumination, W. N. St. Peter. 9: 193(T)—1941
- Principles of colorimetry, Donald J. Lovell. 18: 104—1950

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- Best definition with the pinhole camera, Louis A. Turner. 8: 365—1940
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- Dielectricance, A. Wilmer Duff. **6**: 280—1938
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- Matter of terminology: the kilocalorie and the kilomole, Francis E. Throw. **19**: 436(L)—1951
- Misuse of the names of physical units, Duane Roller. **14**: 340—1946
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- Names of physical concepts, Parry Moon. **10**: 134—1942
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- Proposed new word: *nuclide*, Truman P. Kohman. **15**: 356—1947
- Speed and distance as physical terms, S. K. Haynes. **10**: 52—1942
- Terminology in thermodynamics, W. W. McCormick. **10**: 211(T)—1942
- Use and meaning of the term heat, M. C. Stuart. **6**: 40—1938
- What is centrifugal force? Oswald Blackwood. **12**: 233—1944

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- Action *vs.* reaction. **18**: 54—1950
- Atoms in cartoons, Robert S. Shaw. **14**: 138(T)—1948
- Comic dictionary of physical terms, Marge M. Muller. **20**: 13, 64, 160, 280, 352, 452—1952
- Illustrated definitions, Robert S. Shaw. **18**: 337(A)—1950
- Physics in cartoon and comic strip, Robert S. Shaw. **11**: 47(A)—1943
- Wave theory in cartoons, Robert S. Shaw. **16**: 121(A)—1948

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- Atomic charts, J. T. Shriner. **15**: 163(T)—1947
- Atomic structure chart, W. F. Luder. **11**: 116(A)—1943
- Chart of magnetic units, R. C. Hitchcock. **16**: 366(T)—1948
- Charts, Eric R. Lyon. **2**: 108—1934
- Charts (Recent publications and teaching aids). **6**: 341—1938
- Charts (Teaching aids). **1**: 120—1933
- Charts and pictures (Teaching aids). **2**: 122—1934; **3**: 48—1935
- Charts and posters (Recent publications and teaching aids). **5**: 95, 142, 238, 286—1937; **7**: 204, 268—1939; **8**: 204—1940

- Charts as teaching aids, Bernard H. Porter. **11**: 162—1943
- Circular periodic chart, L. Sibaiya. **9**: 122—1941
- Sample of lecture charts: thermometer scales, E. W. Thomson. **15**: 432(T)—1947
- Westinghouse atomic energy charts, O. Blackwood. **17**: 211(T)—1949

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- Animated blackboard diagrams, Robert L. Petry. **1**: 46—1933
- Animated diagrams for physics demonstrations, Robert Petry. **20**: 325(A)—1952
- Cornu spiral on the blackboard, H. W. Farwell. **14**: 210—1946
- Energy diagrams for beta-disintegration, A. L. Hughes. **16**: 415—1948
- Illustrating the regularity of alpha-radioactivity, F. W. Van Name, Jr. **19**: 230—1951
- Potential against resistance—a graphical review, W. W. Sleator. **19**: 262—1951
- Preparation of graphs for physical papers, D. Roller. **14**: 133—1946
- Three-dimensional diagram of gyroscopic precession, Francis W. Sears. **7**: 342—1939

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- Photographic transparencies for the museum, C. Tanzer. **11**: 51(A)—1943
- Posters (Teaching aids). **4**: 138, 221—1936
- Progressive exhibit method. A new technic in the field of science presentation, Robert P. Shaw. **7**: 165—1939

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- Air masses and fronts, a naval training film, J. A. Day. **15**: 360(T)—1947
- Atmospheric twinkle studies in motion pictures, C. P. Butler. **18**: 393(T)—1950
- Atomic energy. **17**: 461(T)—1949; **18**: 430(T)—1950
- "Atomic energy," a Navy training film, Fred W. Decker. **16**: 325(T)—1948
- Atomic physics. **18**: 332(T)—1950
- "Cold front" and "The warm front," Navy training films, J. A. Day. **15**: 432(T)—1947
- Colored motion photomicrography of the formation of crystals in polarized light, Kent H. Bracewell. **6**: 45(T)—1938
- Comparison of verbal accompaniments to films, William Francis Einbecker. **1**: 62(A)—1933
- Crystal clear (color film). **18**: 519(T)—1950
- Educational film: Review of *Fundamentals of acoustics*, produced by Harvey B. Lemon, Herman I. Schlesinger, Harvey Fletcher, and Donald Mackenzie, Walker Bleakney. **2**: 122—1934
- Educational film: Review of *Sound waves and their sources*, produced by Harvey B. Lemon, Herman I. Schlesinger, Harvey Fletcher, and Donald Mackenzie, Walker Bleakney. **2**: 121—1934

- Effectiveness of a sound motion picture in college physics, C. J. Lapp. **7**: 224—1939
- Exhibit of selected film strips, sound film strips and sound films. **16**: 366(T)—1948
- Experiment on classroom motion pictures, Carl Adams and R. A. Loring. **10**: 165(T)—1942
- Experimental film on wave motion, Robert L. Petry. **5**: 45(A)—1937
- Film-loops for physics teaching, John J. Heilman. **20**: 396(T); 456(A)—1952
- Films selected for first-year college physics, Robert L. Weber. **17**: 408—1949
- Molecular theory of matter and oxidation and reduction (sound film). **1**: 22(T)—1933
- Motion pictures (Recent publications and teaching aids). **1**: 120—1933; **2**: 34, 122—1934; **10**: 123—1942
- Motion picture films (Recent publications and teaching aids). **4**: 95, 138, 221—1936; **5**: 95, 185, 286—1937; **6**: 51, 102, 288, 341—1938; **7**: 204, 268—1939; **8**: 77, 328—1940
- Motion pictures as a review technique for college physics, C. J. Lapp. **3**: 44(T)—1935
- Motion pictures available for use in physics instruction, Cecil O. Riggs. **5**: 127—1937
- Movies of magnetic domains, R. M. Bozorth. **20**: 464(T)—1952
- Physics in motion pictures, Alfred B. Butler. **17**: 447(L)—1949
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- Solar eclipse movies at Khartoum, D. J. Lovell. **20**: 391(T)—1952
- Solar prominences in motion, R. R. McMath. **20**: 323(T); 391(T)—1952
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- Some experiments on the teaching value of sound films in college physics, C. J. Lapp. **7**: 172—1939
- Sound motion pictures as an aid in classroom teaching, Clarence C. Clark. **1**: 31(A)—1933
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- Study of subjects for motion pictures for teaching physics, Robert Petry. **19**: 487(A)—1951
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- Survey of educational films. **4**: 25—1936
- Teaching effectiveness of the sound motion picture, *Electrons*, C. J. Lapp. **7**: 71(A)—1939
- Teaching effectiveness of the sound motion picture "The Electron," C. L. Lapp. **9**: 112—1941
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- Use of cine-loops in physics teaching, Francis E. Throw. **20**: 325(A)—1952
- Use of motion pictures in laboratory dynamical studies, Carl L. Bailey, Jaan Jurisson, and M. Eugene Rudd. **17**: 517—1949

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- Discussion of visual education in general physics, F. T. Hawley. **18**: 165(T)—1950
- Experiment in visual education, J. O. Frank. **1**: 62(A)—1933
- Illumination and color in demonstration experiments, H. K. Schilling and Marsh W. White. **12**: 239(A)—1944
- Leslie's cube, Tyndall apparatus, waves in string, glass and rubber rods, electroscope, electrolysis. **18**: 332(T)—1950
- Mechanical drawing in teaching mechanics, Richard C. Hitchcock. **11**: 161—1943
- Methods of making ultrasonic fields visible, Egon A. Hiedemann. **19**: 486(T)—1951
- More paper for physics teachers, Stanley C. Pearson. **18**: 394(A)—1950
- Preparation of pictorial material for classroom use, Z. V. Harvalik. **20**: 465(A)—1952
- Stroboscopic photographs used in the teaching of mechanics, Francis W. Sears. **10**: 166(T)—1942
- Teaching aids in alternating-current theory for the college physics course, G. P. Brewington and Therese Shepard. **16**: 49—1948
- Tetrahedron test of power to visualize, W. J. McCauley. **1**: 96(A)—1933
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- Visual demonstration of shm relations, F. L. Talbott. **12**: 241(T)—1944
- Visualization of normal coordinates of coupled oscillators, D. R. Inglis. **17**: 391(T)—1949
- Visualization of trigonometry for physics classes, L. E. McAllister. **6**: 168(A)—1938

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- Device for showing vectors in space, Julius Sumner Miller. **18**: 115(L)—1950
- Dynamic atom model, John B. Underwood. **16**: 410—1948
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- Cathode-ray pictures in three dimensions, Otto H. Schmitt. **15**: 432(T)—1947
- Oscilloscope display of damped oscillation curves, Charles Williamson. **18**: 318(T)—1950
- Three-dimensional presentation on cathode-ray tubes, J. L. Daley. **15**: 432(T)—1947

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- Circuit for double stereopticon, L. W. Taylor. **8**: 266(T)—1940  
 Control circuit for double stereopticon, L. W. Taylor. **8**: 260—1940  
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 Projection apparatus for gas laws, T. B. Brown. **12**: 241(T)—1944  
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 Projection of laboratory experiments, Harriett H. Fillinger. **2**: 123(A)—1934  
 Projection of physical experiments, E. L. Harrington. **16**: 233—1948  
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 Semi-automatic film-slide projector, John A. Eldridge. **6**: 45(A)—1938  
 Transparent projections of lecture experiments, W. J. Conway. **7**: 426(A)—1939

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- Cellophane lantern slides, A. J. Ansley. **6**: 345(A)—1938  
 Cellophane roll films for slide lanterns, Ross Bonar, Floyd Bonar, and Earl C. H. Davies. **1**: 57(A)—1933  
 Easily constructed camera for use making lantern slides, Forrest F. Cleveland. **5**: 226—1937  
 Economical method of making lantern slides, G. H. Bell. **8**: 329(A)—1940  
 Film slides (Recent publications on teaching aids). **7**: 268—1939  
 Instructions to lantern slide operators, G. Parr. **13**: 270(A)—1945  
 Lantern slide color mixer, John J. Heilemann. **3**: 184—1935  
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 Lantern slides to illustrate interference patterns due to three and four collinear point-like sources, Harald Perlitz. **6**: 278—1938  
 New idea in projecting microscopic slides, Wm. S. Green, Jr. **2**: 37(A)—1934  
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 Silk cellophane for lantern slides, F. F. Yonkman. **2**: 40(A)—1934  
 Suppliers of lantern slide materials (Recent publications and teaching aids). **6**: 51—1938

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 Visible record of lantern slides, C. J. Koenig. **3**: 46(A)—1935

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- Camera for x-ray powder patterns, L. F. Connell, Jr., and H. C. Martin, Jr. **19**: 127—1951  
 Chemical analysis by the x-ray diffraction method, James W. Ballard. **8**: 264(T)—1940  
 Device for illustrating the production of Laue spots, Paul Kirkpatrick. **8**: 319—1940  
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 Equipment for elementary Laue x-ray studies, William R. McMillan. **13**: 327—1945  
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 One- and two-dimensional x-ray diffraction, B. D. Cullity. **19**: 500—1951  
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 Simple x-ray diffraction camera, Willis C. Campbell. **15**: 409—1947  
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 Structure of cubic crystals as revealed by x-rays, S. S. Sidhu. **14**: 136(A)—1946; **16**: 199—1948  
 Undergraduate experiment in Laue x-ray diffraction, A. H. Weber, J. F. McGee, and K. F. Gerhard. **5**: 279—1937  
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- Birth and early infancy of x-rays, G. E. M. Jauncey. **13**: 362—1945  
 Discovery of x-rays, E. C. Watson. **13**: 281—1945  
 Effect of discovery of x-rays, W. P. Boynton. **19**: 399(T)—1951  
 Thirty years of x-ray research at the General Electric research laboratory, A. W. Hull. **14**: 71—1946

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- Actinoscope, a device to demonstrate the presence of x-rays, Edwin P. Heinrich. **20**: 400(A)—1952  
 Conversion of an optical spectrometer for x-ray problems, Robert H. MacFarland. **20**: 516—1952  
 Dark frame for x-ray photography, J. G. Black. **1**: 16, 21(T)—1933  
 Design and use of an x-ray spectroscope, Paul Kirkpatrick. **15**: 198(A)—1947  
 Electrostatic x-ray generators for medical use, J. G. Trump. **9**: 49(T)—1941  
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- Are x-ray tube demonstrations safe? R. Schlegel and J. C. Lee. **19**: 470—1951
- Demonstration of the difficulty of x-rays analysis, Sir Lawrence Bragg. **11**: 300(A)—1943
- Laboratory course in x-rays, Paul Kirkpatrick. **8**: 326(A)—1940; **9**: 14—1941; Supplementary experiments. **10**: 233—1942
- Nature of biological action of radiations of short wavelength, A. A. Bless. **13**: 266(A)—1945
- Physical methods of dosage determination in x-ray therapy, Edith H. Quimby. **10**: 166(T)—1942
- Physical problems of industrial radiography, Herman F. Seemann. **5**: 238(T)—1937
- Scattering of x-ray photons, Arthur H. Compton. **14**: 80—1946
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- Detection of soft x-rays with a scintillation counter, Lyman A. Webb, Ronald S. Paul, and Francis E. Dart. **19**: 483(T)—1951
- Measurement of relative intensities of soft x-rays, Charles L. Owens. **10**: 165(T)—1942
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- Radiation intensities near a demonstration x-ray tube, R. Schlegel. **19**: 400(T)—1951



















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