

ject for themselves. The experiments which form the central part of the book are carried out with the simplest possible apparatus. Although the main purpose of the book is to set forth the purely scientific aspects of electro-chemistry, the practical side of the subject has not been left altogether unknown. Technical electro-chemical processes, especially the processes of electro-metallurgy, which is so important at present, are referred to in their proper places. It is a work of great value to all professors and students of chemistry.

Woodworkers' Tools (400 pages, price \$1), by Charles A. Strelinger & Company, of Detroit, Mich., is a good deal more than an ordinary catalogue; for, in addition to its numerous illustrations of tools and machinery, it gives a great deal and a wide variety of practical information relative to their employment, well calculated to assist the workman or apprentice. It includes tools used by carpenters, builders, cabinet makers, pattern makers, millwrights, carvers, and ship carpenters, as well as implements for draughtsmen, etc. A supplementary chapter is designed to place before the practical mechanic simple illustrations of the first principles of geometry.

SCIENTIFIC AMERICAN BUILDING EDITION

AUGUST, 1897.—(No. 142.)

TABLE OF CONTENTS.

- No. 1. Two perspective elevations (one in colors) and floor plans of a cottage at Binghamton, N. Y., recently erected at a cost of \$3,500 complete. Mr. Alfred Bartoo, architect, Binghamton, N. Y. An attractive design in the English style.
No. 2. A cottage at Scranton, Pa., recently erected for Mr. E. Healy, at a cost of \$7,000 complete. Perspective elevation and floor plans. A modern design well treated. Mr. Edward H. Davis, architect, Scranton, Pa.
No. 3. A residence at Prohibition Park, S. I., recently erected for Mr. J. W. Hoban, at a cost of \$3,900 complete. Excellent design of modern American style, with Colonial treatment and detail. Mr. John Winans, architect and builder, Prohibition Park, S. I. Two perspective elevations and floor plans.
No. 4. A suburban school house at Overbrook, Pa., designed to resemble a private residence instead of a public building. An exceedingly attractive design. Mr. William L. Price, architect, Philadelphia, Pa. Two perspective elevations and floor plans.
No. 5. Residence at Larchmont, N. Y., recently erected for Mr. Henry A. Van Liew. Pleasing design, with many excellent features. Two perspective elevations and floor plans; also a view of stable, with ground plan. Mr. H. C. Stone, architect, New York City.
No. 6. Cottage at Clinton Township, N. J., recently erected for the Protective Building and Loan Association, at a cost of \$1,500 complete. Two perspective elevations and floor plans. Messrs. Hobbs Brothers, architects, Newark, N. J. A neat design.
No. 7. A residence at Larchmont, N. Y., recently erected for Miss Flint. Two perspective elevations and floor plans. The design presents a good, modern, sensible house of pleasing appearance, treated with Colonial detail. Messrs. G. E. Harney and W. S. Purdy, architects, New York.
No. 8. Residence at Prince's Bay, Staten Island, recently erected for A. W. Browne, at an approximate cost of \$3,000. A rustic design of much artistic merit. Perspective elevation and floor plan. Mr. F. W. Beall, architect, New York City.
No. 9. Cottage at Forest Hill, N. J., recently completed for Mr. Charles W. Clayton, at a cost of \$3,800 complete. An attractive design. Perspective elevation and floor plan. Mr. H. Galloway Teneyck, architect, Newark, N. J.
No. 10. Residence at Evanston, Ill., recently erected for Mr. C. B. Congdon. A substantial and dignified design. Two perspective elevations and floor plans. Messrs. A. M. F. Colton & Son, architects, Chicago, Ill.
No. 11. A pulpit of the Cathedral of Treves. Half page engraving.
No. 12. Washington Monument, Philadelphia. Presented to the city by the State Society of the Cincinnati and unveiled by President McKinley. One of the most important and imposing monuments ever erected in the United States. Cost \$250,000. Designed by Mr. Rudolph Siemering, the German sculptor.
No. 13. Miscellaneous Contents: Palais Royal to be demolished.—Largest hotel on earth.—A quick piece of work.—Drawing materials, surveyors' instruments, etc.—Statue of Mercury at the Nashville Exposition, illustrated.—Compo-board.—Improved heaters and furnaces, illustrated.—Stair builders' goods.—Architects' and builders' directory.
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Business and Personal.

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Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication.
References to former articles or answers should give date of paper and page or number of question.
Inquiries not answered in reasonable time should be repeated: correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.
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Scientific American Supplements referred to may be had at the office. Price 10 cents each.
Books referred to promptly supplied on receipt of price.
Minerals sent for examination should be distinctly marked or labeled.

(7189) E. G. A. asks: Please say in what number of your paper I can find instructions for making a kite without a tail. A. Valuable illustrated articles on the construction and flying of tailless kites will be found in SCIENTIFIC AMERICAN, Nos. 20, vol. 55; 12, vol. 53; 10, vol. 70; 11, vol. 71; 11, vol. 74; 4, vol. 76; also SUPPLEMENT, Nos. 583, 1013, 1016, 1070. Price 10 cents each prepaid by mail.

(7190) W. H. asks: 1. In making the eightlight dynamo described in SUPPLEMENT, No. 600, could not the armature core be built of thin disks of iron, extending to the shaft, or could the wooden sleeve be replaced by one of brass? A. The armature core may be built of disks of the softest sheet iron about one-twentieth inch in thickness. These are sometimes perforated for ventilation. The disks are to be separated from each other by similar disks of thin paper or they may be oxidized. This prevents eddy currents through core. They may be keyed to the shaft or fastened together by bolts. No metal other than iron should be used in core, since iron alone has magnetic value. 2. Has an alternating current P. and N. poles? It seems to me, if the current were rapidly reversed, there would be no poles. A. The poles reverse two or more times with every revolution of the alternating dynamo, and no effort is made to name them. 3. What is meant by consequent and salient poles? A. Consequent poles are poles formed in the length of a magnet, and alternating in sign. In field magnets, salient poles are those projecting from the main body of the field magnet.

(7191) D. K. writes: I wish to light a 6 candle power 9 to 12 volt lamp for about 4 hours per night. I have 6 storage cells of 5 plates each, plates 6x8 inches. 1. How many Grove, Bunsen or Daniell batteries would it take to charge the above? A. Use 15 Daniell or gravity cells, or 10 Grove or Bunsen. 2. Which of the above batteries is the most suitable? A. Daniell or gravity. The others both give off corrosive vapors and must be kept out of doors or in a box outside of a window. 3. Would smaller plates in the storage battery be better? A. If the cells are of any of the standard makes, they could be cut down to about half the original size. To determine this, remove one pair of plates from each cell and find the amperes the battery will give as compared with full size. Then cut down the plates proportionally.

(7192) J. J. R. asks: 1. What does a dry battery consist of? How is it made up? Give me all the facts and what powders to use to bring out the electric spark. This must be a dry battery and a small one. Give me the cost of its make up. A. There are no dry cells, that is, cells containing only dry powders. The so-called dry cells are usually Leclanche cells in type. They are made with a rod or strip of zinc and a plate or cylinder of carbon. These are immersed in a paste composed of a saturated solution of sal ammoniac in water, into which plaster of Paris, gelatine, or some other substance is stirred till the liquid is held so that it will not run out if the cell is upset. In a sense it is dry. The cost depends on size, materials and make-up. It is not possible to give figures. See a valuable paper on dry cells in SCIENTIFIC AMERICAN SUPPLEMENT, No. 1001, 10 cents. 2. Also give me a few principles of how to deal with pyro-electricity of certain minerals possessed with the electric heat and form a brush glow spark. A. There are

no minerals which give out electric heat and a glow spark with pyro-electricity. Tourmaline, boracite, and other minerals may be electrified by heating so as to attract light bodies to their ends, in a manner similar to rubbed sealing wax. Mica will glow in the dark on being suddenly split, and a lump of sugar will do the same on being crushed or cracked. A piece of card will give out sparks on being torn asunder in the dark. See S. P. Thompson's "Lessons in Electricity," Pp. 77-80. 3. Also if magnesium wire can be used possessed of heat, and can be controlled. A. Magnesium ribbon is burned in a lamp invented for that purpose, with full control. Apply to some dealer in physical apparatus.

(7193) A. J. C. asks for a recipe for making white metal. A. White metal is made by a number of formulas. It depends upon the use to which it is to be put. Try the following: Tin, 9 ounces; lead, 2 ounces; antimony, 1 ounce; bismuth, 2 ounces.

(7194) R. H. D. asks: How can I fasten cloth to brass or zinc? A. Use equal parts of pitch and gutta percha melted together and used hot. The following formula has also been recommended for the purpose: Gutta percha, 16 parts; pure, unvulcanized rubber, 4 parts; pitch, 2 parts; shellac, 1 part; linseed oil, 2 parts. Digest the rubber in the linseed oil; melt the gutta percha, pitch and shellac and add the digested rubber.

(7195) E. A. B. says: Please answer the following in your query column: In using a Baume hydrometer for acids at 60° F. in a diluted solution of 2 or 3 per cent acid, what is the variation of the hydrometer reading when the thermometer reading in the solution is over 60° up to 80° or 90°, for instance? A. The small amount of acid in solution 2 or 3 per cent will change the density of the water very little. The density of a 5 per cent solution in pure water is 1.033. Hence the change of hydrometer reading is practically that which is produced by change of temperature, and this is very little for a change from 60° to 80°. Not as much as 1 on Baume's scale. The temperature was not considered in making the Baume scale. You can easily determine the matter experimentally. Bring your liquid below 60° and heat it very slowly, stirring to keep it uniform in temperature throughout. Observe both thermometer and hydrometer and record the readings of hydrometer for temperatures from 60° to 80°, or, in fact, as high as you need in your work. You will then have a table of corrections for your hydrometer.

(7196) N. E. S. asks: Will you please publish in "Answers to Queries" in SCIENTIFIC AMERICAN, the formula for making the hectograph? I have been a reader of this valuable publication for over three years past. I have noticed this formula in one of my papers, I think, but, as some of my papers were accidentally destroyed, I lost the formula. A. Formulas for hectograph compositions are given in our SUPPLEMENT numbers 438, 1092 and 1110, which we can supply at 10 cents each.

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An experience of nearly fifty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

AUGUST 17, 1897.

- AND EACH BEARING THAT DATE.
[See note at end of list about copies of these patents.]
Abrasive materials, applying, W. L. Kann..... 588,441
Accumulator battery, J. V. & H. H. Sherrin..... 588,189
Acid and making same, trimethylbenzyl uric, E. Fischer..... 588,412
Acing machine, C. H. Bigelow..... 588,290
Adding machine, W. J. Ensworth..... 588,409
Advertisements, machine for exhibiting movable, H. L. Peters..... 588,172
Air compressor, I. H. Spencer..... 588,236
Alarm, See Burglar alarm.
Animal trap, J. H. McWhirter..... 588,167
Aryll guide, J. L. Thomson..... 588,505
Ash conveying apparatus, F. J. Weber..... 588,518
Autographic register, T. F. Schirmer..... 588,359
Autoharp, Taylor & Eschemann..... 588,396
Axle lubricator, railway, W. Silver..... 588,247
Bag or purse frame, Hering & Fuller..... 588,334
Bale tie, C. C. Warren..... 588,514
Ball float, G. B. Moore..... 588,461
Bar, See Bicycle handle bar. Spring bar. Velocipede handle bar.
Batteries, application of solar heat to thermo, H. C. Baagan, Jr..... 588,177
Battery, See Accumulator battery.
Bed clothing retainer, C. F. Heath..... 588,427
Bed fastening, S. B. Regester..... 588,475
Bedstead, M. S. Keeler..... 588,442
Beer pipe cleaner, P. F. Gaynor..... 588,418
Bicycle, C. R. Harris..... 588,274
Bicycle, J. C. Raymond..... 588,472
Bicycle brake, Steele & White..... 588,538
Bicycle fork crown cover plate, C. S. Smith..... 588,190
Bicycle gear ease, H. J. Buell..... 588,124
Bicycle guide and lantern bracket, F. G. Smith..... 588,435
Bicycle handle bar, adjustable, J. J. Rexroth..... 588,242
Bicycle or vehicle brake, F. Ecaubert..... 588,270
Bicycle stand, H. L. & G. A. Banker..... 588,376
Bicycle stand, H. K. Porter..... 588,291
Bicycle support, G. H. Williams..... 588,542
Bicycle, trolley, R. T. Oney..... 588,465
Bicycle valve, J. A. Steurer..... 588,364
Bicycle wheel, G. Hayes..... 588,332
Block, See Fuse block. Pulley block.
Blower or exhauster, D. R. Ward..... 588,513
Blower, rotary, T. W. Green..... 588,529
Blowpipe, J. C. Van Slyke..... 588,200
Bolt or wire cutter, K. Rowe..... 588,187
Bottle, A. Bourke..... 588,216
Bottle, G. T. Fitzgerald..... 588,413
Bottle and stopper therefor, J. H. Springfield..... 588,499
Bottle, non-refillable, W. L. & V. R. Roth..... 588,295
Bottle stopper, C. Meyer..... 588,285
Bottle stopper lock, G. L. Abbott..... 588,211
Box, See Journal box. Musical box. Paper box.
Bracket, See Clamp bracket.
Braiding machine, A. V. Groupe..... 588,421
Brake, See Bicycle brake. Bicycle or vehicle brake. Car brake. Vehicle brake.
Brake and fender, combined, A. H. Wheeler..... 588,255
Brush, clothes, R. T. Hewlett..... 588,148
Burglar alarm, electric, C. Coleman (reissue)..... 11,696
Burial casket, C. A. Ruebekam..... 588,482

- Burner, See Gas burner. Hydrocarbon burner. Petroleum burner. Regenerative burner.
Burning naphtha, etc., apparatus for, W. Solomin..... 588,191
Calculator, ready, C. F. & C. K. Christopher..... 588,128
Can, See Varnish can.
Can capping machine, M. E. Howard..... 588,337
Can opener, E. E. Robbins..... 588,243
Cancelling stamps and affixing postmarks to letters, machine for, J. T. Killeen..... 588,152
Cane splitting machine, G. A. Watkins..... 588,516
Car brake for inclined railways, G. G. Bittner..... 588,122
Car coupling, automatic, R. B. Green..... 588,420
Car door, A. G. Steinbrenner..... 588,530
Car fender, T. R. H. Johnson..... 588,226
Car fender, L. Mercier..... 588,160
Car fender or guard, tramway, E. S. Wilkins..... 588,205
Car running gear, mine, L. R. Faught..... 588,325
Car step, F. G. Brubaker..... 588,123
Car step, revolving extension passenger, Gar-tank & Ricketts..... 588,417
Car window, railway, S. S. Bradshaw..... 588,543
Carbonizing machine, A. H. Eyles..... 588,136
Carbureter, D. Best..... 588,381
Card, packing and display, E. Sachs..... 588,245
Carriage engine, Dobson & Bromley..... 588,132
Carriage, B. Kendall..... 588,443
Case, See Bicycle gear case.
Cash register and recorder, T. Carney..... 588,127
Casket handle, O. Zaucho..... 588,210
Casket handle holder and adjuster, E. A. Yocum..... 588,209
Cementing device, G. A. Watkins..... 588,517
Chain bucket, A. W. Robinson..... 588,531
Chair, See Folding chair. Rail chair.
Chamber vessel attachment, W. H. & G. M. G. Weston..... 588,304
Checkrein hook, A. W. Laughlin..... 588,341
Chimney, owl, F. W. Simmons..... 588,482
Chocolate drops, machine for dipping, P. Farnoulias..... 588,349
Churn, N. Ofer..... 588,286
Churn dasher, W. Dulin..... 588,408
Churn motor, A. B. Talbot..... 588,193
Cigar wrapper cutter, E. Roberts..... 588,477
Clamp, See Nail clamp. Wire clamp.
Clamp bracket, M. E. Crowell..... 588,401
Cleaner, See Beer pipe cleaner. Dish cleaner. Rake cleaner.
Closet, See Water closet.
Clothes wringer, W. A. Lippold..... 588,453
Coating sheet metal plates, apparatus for, Roberts & Stoddard..... 588,478
Coffin raising or lowering device, J. H. Zook..... 588,307
Colors, developing, A. Weinberg..... 588,203
Column or other structural support, composite, W. M. Foidexeter..... 588,290
Comb..... 588,229
Combination lock, C. D. Logan..... 588,299
Combustion engine, A. G. Pace..... 588,466
Condenser, steam engine, W. T. Snell..... 588,497
Conveyer, C. Thompson..... 588,257
Coop or crate, folding, O. J.erry..... 588,368
Coping device, H. H. Lyford..... 588,411
Corking machine, Flower & Cousins..... 588,414
Corset fastener, F. Carlson..... 588,217
Cover support, box opener, hammer and stamp eraser, R. L. Dobson..... 588,407
Coupling, See Car coupling. Pipe coupling. Thill coupling.
Culinary utensil, C. R. Jones..... 588,410
Cupboard, F. C. Geiger..... 588,134
Current generator, direct, B. G. Lamme..... 588,219
Currycomb, L. Powell..... 588,259
Curtain adjustable, G. G. Boswell..... 588,291
Curtain fixture, H. Lyford..... 588,454
Curtain fixture, E. A. Roberts..... 588,244
Cushion, See Pneumatic seat cushion.
Cutter, See Bolt cutter. Cigar wrapper cutter.
Cycle, B. F. Shurz..... 588,361
Cycle driving mechanism, W. H. Trengrove..... 588,186
Cylinder, bell, Taylor..... 588,196
Dental engine attachment, F. W. Keltner..... 588,444
Desk lid support, B. E. Kipp..... 588,228
Dish cleaner, R. M. Daniels..... 588,219
Door indicator, H. Hinkle..... 588,149
Door or window, mash, S. J. Horchler..... 588,527
Drier, See Tobacco stem drier.
Drill, See Grain drill.
Dust from air, apparatus for separating, J. E. Mathewson..... 588,457
Dye, bluish scarlet, I. Rosenberg..... 588,180
Dye, brown substantive, I. Rosenberg..... 588,183
Dye, gray, A. Cobenzl..... 588,207
Dye, mixed substantive, I. Rosenberg..... 588,182
Dye, reddish violet, I. Rosenberg..... 588,181
Dyeing, V. G. Bloede..... 588,387
Dyeing aniline black, V. G. Bloede..... 588,388
Dynamo, motor or rotary transformer, multipolar, S. H. Short..... 588,491
Eaves trough hanger, D. P. Isham..... 588,151
Electric contact device, D. S. Shallenberger..... 588,188
Electric currents, method of and apparatus for multiple rate metering for, E. Oxley..... 588,170
Electric furnace, G. De Chalmet..... 588,267
Electric generator or motor, brush holder and port for, S. H. Short..... 588,490
Electric herb pad, A. Roedel..... 588,479
Electric lights, carbon holder for, O. S. Moss..... 588,233
Electrical apparatus, protective appliance for, A. E. Williams..... 588,206
Electrical conductor, J. D. Bishop..... 588,382
Electrolytic apparatus, E. Balbach, Jr..... 588,524
Electrolytic process and apparatus therefor, C. Keltner..... 588,276
Elevator controllers, means for locking, T. G. Turner..... 588,540
Enamel, device for supporting brass tubes when applying, W. C. Degelman..... 588,404
Engine, See Combustion engine. Fire engine. Heat engine. Rotary steam engine.
Engines, brake wheel for hoisting, G. S. Binckley..... 588,261
Exercising device, K. F. Perkins..... 588,350
Extractor, See C.P. extractor.
Eyeglasses, Prudden & Jensen..... 588,175
Fabric, See Stiffening fabric.
Fan attachment, C. E. Mayo..... 588,282
Faucet, R. Rowe..... 588,357
Feed water heater, locomotive, J. B. Barnes..... 588,377
Feed water pump, A. M. Duffer..... 588,323
Feeding mechanism, Lamb & Bales..... 588,450
Fence, combined hedge and wire, D. W. Crider et al..... 588,400
Fence post, H. Taylor..... 588,196
Fender, See Fender.
Fire engine, electric, G. W. Cox..... 588,399
Fire escape, A. Boemmel..... 588,369
Fire screen, J. H. Havocotte..... 588,146
Flush switch, L. Heck..... 588,428
Folding chair, T. A. Matthews..... 588,159
Folding knife, fork or spoon, F. Frauneger..... 588,174
Frame, See Bag or purse frame. Pocket book or bag frame.
Fruit gatherer, W. J. Thomas..... 588,197
Fuel for power, apparatus for utilizing liquid or gaseous, S. A. Reeve..... 588,178
Furnace, See Electric furnace.
Furniture, See Furniture.
Fuse block, H. A. Sinclair..... 588,536
Game apparatus, J. R. Brennan..... 588,294
Gas apparatus, J. Leede..... 588,154
Gas burner, dry oil, C. H. West..... 588,520
Gas from carbids, generating, E. F. Mackusick..... 588,250
Gas generator, acetylene, F. Simons..... 588,249
Gas heating burners, regulating contrivance for, H. Kikow..... 588,227
Gate, See Hinge roller gate. Railway cattle gate. Water wheel cylinder gate. Water wheel register gate.
Gate, E. Brandenburg..... 588,544
Gate, J. F. Murphy..... 588,195
Gauntlet, W. E. Harloe..... 588,426
Gearing, changeable, L. G. Billings..... 588,316
Gearing, planetary, W. S. Rogers..... 588,39
Generator, See Current generator. Gas generator. Steam generator.
Glass articles, apparatus for manufacturing, H. Brooke..... 588,318
Glass articles, apparatus for manufacturing pressed, H. H. Pitt..... 588,173
Glass, moulding, H. Brooke..... 588,319
Gold and other precious metals from their ores, separating, H. A. Rodes..... 588,476
Grain drill, C. H. Pelton..... 588,240
Grain drill gearing, C. H. Pelton..... 588,239
Grate, W. L. Church..... 588,386
Grater, nutmeg, R. J. Williams..... 588,207
Grinding machine, automatic, C. F. Sperry..... 588,249
Gun, gas operated, Benet & Mercie..... 588,380
Guns, lever locking mechanism for lever, T. G. Bennett..... 588,315
Gypsum rock to imitate marble, treating, G. W. Parker..... 588,287
Hammer, mechanical or drop, C. Gruber..... 588,422
Handle, See Casket handle.
Hanger, See Eaves trough hanger.
Harness work, setting tool for, J. L. Thomson..... 588,369
Harrow, disk, Bissell & Thomson..... 588,383
Harrow, riding, Sturges & Taylor..... 588,192
Harvester shock binding and ejecting mechanism, W. M. Platt..... 588,469
Hat brim stiffening machine, E. S. Alvord..... 588,372
Hat, sunshade, R. Ray..... 588,241
Hay tedder, direct central draught or drive, H. E. & H. Zoutz..... 588,523
Heat engine, See Heat engine.
Heater, See Feed water heater. Water heater.
Hinge roller gate, J. Askew..... 588,374

(Continued on page 142.)