ject for themselves. The experiments which form the central part of the book are carried out with the simples 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 electrochemical 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.)

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- 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 \$3,300 complete. Excellent design of modern Ameristyle, with Colonial treatment and detail. Mr. John Winans, architect and builder, Prohi-bition Park, S. I. Two perspective elevations and floor plans.
- No. 4. A suburban school house at Overbrook, Pa., de signed 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.
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- 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. 'Iwo 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 \$8,000. 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 dignifled design. Two perspective elevations and floor plans. Messrs. A. M. F. Colton & Son, architects, Chicago, Ill.
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- 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 monu-

Business and Personal.

The charge for insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the follow ing week's issue.

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HINTS TO CORRESPONDENTS.

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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Minerals sent for examination should be distinctly

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. 58; 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 eightlightdynamo 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 re placed 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. may be keyed to the shaftor 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 6×8 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 ments ever erected in the United States. Cost vapors and must be kept out of doors or in a box outside

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 suddenlysplit, 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 num-ber 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 followng 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 AMERI-CAN, 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.

TO INVENTORS.

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 posses unequaled 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 perions 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 dress MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

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 Door or window sash. S. J. Horcheler	588,149 588,527 588,157 588,149 588,157 588,180 588,180 588,180 588,190 588,190 588,190 588,387 588,388 588,387 588,388 588,191 588,181 588,181 588,181 588,181 588,190 588,490 588,490 588,201 588,20
Door of indicator, H. Hinckley. Door or window sash. S. J. Horcheler	588,149 588,527 588,157 588,149 588,157 588,180 588,180 588,180 588,180 588,180 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,170 588,261 588,261 588,276 588,201 588,20
Door of indicator, H. Hinckley. Door or window sash. S. J. Horcheler	588,149 588,527 588,157 588,149 588,157 588,180 588,180 588,180 588,180 588,180 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,170 588,261 588,261 588,276 588,201 588,20
Door of indicator, H. Hinckley. Door or window sash. S. J. Horcheler	588,149 588,527 588,157 588,149 588,157 588,180 588,180 588,180 588,180 588,180 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,170 588,261 588,261 588,276 588,201 588,20
Door of indicator, H. Hinckley. Door or window sash. S. J. Horcheler	588,149 588,527 588,157 588,149 588,157 588,180 588,180 588,180 588,180 588,180 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,170 588,261 588,261 588,276 588,201 588,20
Door of indicator, H. Hinckley. Door or window sash. S. J. Horcheler	588,149 588,527 588,157 588,149 588,157 588,180 588,180 588,180 588,180 588,180 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,181 588,170 588,261 588,261 588,276 588,201 588,20
 Door or indicator, H. Hinckley. Door or window sash. S. J. Horcheler. Drier. See Tobacco stem drier. Drill. See Grain drill. Dust from air, apparatus for separating, J. E. Mathewson. Dye, bluish scarlet, I. Rosenberg. Dye, mixed substantive, I. Rosenberg. Dyeing, V. G. Bloede. Dynamo, motor or rotary transformer, multipolar, S. H. Short. Eaves trough hanger, D. P. Isham. Electric currents, method of and apparatus for multiple rate metering for, E. Oxley. Electric currace, G. De Chalmot. Electric currace, G. De Chalmot. Electric lepits, carbon holder for, O. S. Moss. Electric lepits, carbon holder for, O. S. Moss. Electroit capparatus, protective appliance for, X. S. Williams. Electrolytic process and apparatus therefor, C. Kellner. Elever controllers, means for locking, T. G. Turner. Elever controllers, means for locking, T. G. Turner. Engine. See Combustion engine. Fire engine. Heat engine. Relary steam engline. Exercising device, F. P. Perkins. Extractor. See Stiffening fabric. Fan attachment, C. E. Mayo. Fan etachment, C. B. Mayo. Fan etachment, C. B. Mayo. Fan etachment, C. B. Mayo. Feed water purifier, A. M. Dufy. Free See Lar Inder. From See Carl forder. Frame. See Bag or purse frame. Pocket book or bag frame. Folding knife, fork or spoon, F. Prauegger	588,149 588,527 588,152 588,152 588,162 588,162 588,162 588,161 588,387 588,388 588,387 588,388 588,110 588,181 588,181 588,181 588,181 588,181 588,181 588,191 588,20
 Door or window sash. S. J. Horcheler	588,149 588,527 588,152 588,152 588,162 588,162 588,162 588,161 588,387 588,388 588,387 588,388 588,110 588,181 588,181 588,181 588,181 588,181 588,181 588,191 588,20

menus ever creeted in the United Satest		C. Reagan, Jr 588,177	ister gate.
\$250,000. Designed by Mr. Rudolph Siemering,	of a window. 3. Would smaller plates in the storage	Battery. See Accumulator battery. Bedclothing retainer, C. F. Heath	Gate, E. A. Brandenburg. 588.544
the German sculptor.	battery be better ? A. If the cells are of any of the stand-	Bedclothing retainer, C. F. Heath 588,427	Gate, J. F. Murphy 588,165
	ard makes, they could be cut down to about half the	Bed fastening, S. B. Regester 588,475	Gauntlet, W. E. Harloe 588,426
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piece of work - Drawing materials, surveyors'	plates from each cell and find the amperes the battery will		
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Nashville Exposition, illustrated Compo-	plates proportionally.	Bicycle gear ease, H. J. Buell	Glass articles, apparatus for manufacturing
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