Business and Personal.

The charge for insertion under this head is One Dollar 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.

Marine Iron Works. Chicago. Catalogue free. For logging engines. J. S. Mundy, Newark, N. J.

U. S." Metal Polish. Indianapolis. Samples free. Gasoline Brazing Forge, Turner Brass Works, Chicago. Yankee Notions. Waterbury Button Co., Waterb'y, Ct. Handle & Spoke Mchy. Ober Lathe Co., Chagrin Falls, O. Machine Work of every description. Jobbing and repairing. The Garvin Machine Co., 141 Varick St., N. Y.

FERRACUTE Machine Co., Bridgeton, N. J. Full line of Presses. Dies and other Sheet Metal Machinery. Easy Experim'ts of Organic Chemistry. Book by Prof. Appleton. 60 cents. Snow & Farnham, Providence. R. I. R. Brent Mitchell President of the Thackeray Incinerating and Fertilizing Company, is at the Hotel Empire, Cor. 63d St. and Columbus Avenue, N. Y.

Hub, spoke, wheel, bending, and handle machinery, Single machines or full equipments, by the Defland Machine Works, Deflance, Ohio, U. S. A.

The celebrated "Hornsby-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Refrigerating Machine Company. Foct of East 138th Street, New York.

The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4. Munn & Co., publishers, 361 Broadway, N. Y.

Engineers and Firemen-Send 10cfora 24 page pamphlet, containing a list of questions asked by an examining board of engineers. Address Geo. A. Zeller, Bookseller, St. Louis, Mo.

Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway



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 This is for our information and not for publication.

Beferences 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.

Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Prace 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(7517) R. H. L. asks: Would you kindly inform me as to the resistance of a mile of No. 10 German silver wire, one mile of No. 10 galvanized iron wire and the weight of one cubic foot of German silver? A. The specific resistance of copper is 1.6, of annealed iron 9.69, and of German silver 20.89. The resistance of one mile of No. 10 A. W. G. hard-drawn pure copper wire is 5.28 ohms. The resistance of an iron wire of same gage is found by dividing 5:28 by 1:6 and multiplying the result by 9.69, which gives 32 ohms nearly. Similarly, the resistance of the German silver wire is found to be 68.94 ohms. The density of German silver varies with its composition, from 8.30 to 8.77, and the weight of a cubic foot varies correspondingly, from 518 pounds to 547 pounds. See Gray's "Physical Tables." Smith-sonian Institution's Collections, No. 1038. Tables 264,

(7518) W. B. asks: What are the carrying capacities of Nos. 24, 22, 20 copper wire? A. These fine wires, judged by the Fire Underwriters' Rules. have no carrying capacities, since their use is forbidden. Still, carrying capacities may be calculated for them upon the same basis as for other wires. The general assumption is that a wire should not be heated by its current above 140° Fah. This will limit the amount of current a wire can carry in different situations. In a heated place it can not carry so much as in a cool place, in moulding less than in open works, in close coils less than in open ones, with deep winding less than with shallow winding on a spool. It is found that from 1,000 to 4,000 ampered per square inch of cross section are practical limits of carrying capacity. To find allowable current for any wire, multiply its area of cross section by the number of amperes per square inch. At 1,000 amperes per square inch the carrying capacity would be: No. 24, 0.32 ampere; No. 22, 064 ampere; No. 20, 0:00 ampere; No. 18, 128 amperes. For other rates per square inch the carrying capacity would be in the same proportion.

or at least for a long time? A. Water, 1 quart; alum, 34 unce. Dissolve, and when cold, add flour to make it of the consistence of cream, then bring it to a boil, stirring it all the while. Paste may be preserved with aid of oil of cloves, ten drops to the pound, or an equalamount of carbolic acid.

(7521) H. A. H. writes: Have six cells dry battery which have never been used, but have stood idle for some time. Can they be recharged at slight expense, and how? A. Dry cells should not lose their activity by standing idle. They can only do so by corrosion of the metallic parts or by the drying of the paste in them. You can see if there has been corrosion. If the paste is dry, you can bore a hole through the top and put some water into the cell. After it bas soaked a day or two, pour the remaming water out again and stop up the hole with any convenient stopper.

NEW BOOKS, ETC.

REMINISCENCES OF NEAL DOW. Recollections of Eighty Years. Portland, Me.: Evening Press Publishing Company. 1898. Pp. 769. 8vo. Plates. Price \$2.50.

The autobiography of a public character like Neal Dow is always attractive. Some of his early reminiscences are particularly interesting. He attended an acedemy, and he goes on to say, "One attraction to me was a large philosophical apparatus, which was said to be of the best construction and workmanship of its time. Through it I acquired a taste for mechanics in all branches. As one result of this I may here add that I have been a subscriber to the Scientific AMERICAN from its first publication, I think, to the present time, and have never failed to carefully read each number when I have been at home with opportunity so to do." This is certainly a handsome compliment to the Scientific American, coming as it does from so

Acqua, Elettricita, Trazione. Questioni ferroviare urgenti. Naples: Tipografia Pontieri e Velardi. 1898. Pp. 117.

PAINTING TO PREVENT CORROSION. With Specifications. By A. H. Sabin, M.S. New York: Edward Smith & Company. 1898.

This is a very handsome little booklet filled with excellent engravmgs showing corroded metal surfaces and different structures which have been treated with durable metal coatings. The book is handsomely printed, and while in the nature of a trade publication, it is filled with valuable information.

COMMERCIAL ORGANIC ANALYSIS. Treatise on the Properties, Proximate Analytical Examination and Modes of Assaying the Various Organic Chemicals and Products employed in the Arts, Manufactures, Medicine, With Concise Methods for the Detection and Determination of the Detection and Determination of their Impurities, Adulterations, and Products of Decomposition. By Alfred H. Allen. Second edition re-vised and enlarged. Vol. IV. Pro-teids and Albuminous Principles, Proteoids or Albuminoids. Phila-delphia: P. Blakiston's Son & Com-pany. 1898. Pp. 584. Price \$4.50.

A few weeks ago it was our privilege to review the first volume of this important work, and we now congratulate the publishers on the second revised and enlarged edition of Volume IV., which takes up proteids and albuminous principles and proteoids or albuminoids. Among the subjects treated are eggs, milk, meat and meat products and proteids of digestion, composition of the blood, gelatine, glue, dyeing, the hair, wool, etc. Those who consider that a thoroughly scientific chemical work must be dull and uninteresting will have their minds disabused of this idea by perusing the volume before us. It is filled with information which is of value to every food manufacturer, to the doctor, and to every

HAND BOOK OF CORLISS STEAM EN-GINES. Describing in a Compre-hensive Manner the Erection of Enreines, the Adjustment of the Corliss Valve Gear, and the Care and Management of Corliss Steam Engines. By F. W. Shillitto, Jr. Bridgeport, Conn.: The American Industrial Publishing Company. 1898. Pp. 224 Price \$1 224. Price \$1.

The demand for an elementary treatise on the Corlise engine has induced the author to undertake the preparation of this volume. Various types of Corliss engines are taken up in order, and information is given regarding their erection and adjustment. The book is well illus-

and by applications to problems in physics and engineer ing and other branches of mathematies, to show the practical value of the calculus. This text book is intended for students who have a working knowledge of elementary geography, algebra, trigonometry, and analytical

MODEL HOUSES FOR LITTLE MONEY. By W. L. Price. New York: Doubleday & McClure Company. Philadel-phia: Curtis Publishing Company. 1898. Pp. 193. 18mo. Illustrated. Price 50 cents.

The present volume is made up from articles which have appeared in the Ladies' Home Journal and it is designed to be of aid in the building of small homes, the designing of which is too frequently left to the builders or others who are ignorant of architecture. The plans are on rather a small scale and the subject cannot be adequately treated in a book of such small dimensions, and on this account it is hardly, as successful as "Inside of a Hundred Homes," which we also review. The section relating to the remodeling of doors and windows is the most interesting in the volume.

Inside a Hundred Homes. By W. M. Johnson. New York: Doubleday & McClure Company. Philadelphia: Curtis Publishing Company. 1898. Pp. 140. 18mo. Price 50 cents.

The little volume before us contains photographic glimpses into a hundred of the most tasteful homes in America, where taste has gone further than money. The illustrations give hundreds of new ideas furnished by these actually existing rooms, which have not the cold formality of rooms shown by the large decorators and furniture dealers. It shows the extraordinary pro gress of modern book making when such a beautiful little volume can be produced at such a moderate cost.

The "Drama of Glass," by Kate Field, published by the Libbey Glass Company, of Toledo. Ohio, is one of the handsomest little trade publications which we have ever seen. The little half tones are exquisite examples of the photo-engraver's art. It will be emembered that the Libbey Glass Company had one of the most remarkable exhibits at the World's Fair, and there is no doubt that this exhibit of artistic cut glass has done much to popularize cut glass in the last few years, as many persons were able to see for the first time what cut glass really is and how it is made.

TO INVENTORS.

An experience of 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 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 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

NOVEMBER 8, 1898,

AND EACH BEARING THAT DATE. [See note at end of list about copies of these patents.]

Acid receiver and pressure regulating mechanism, combined carbonic, R. Wmnikes. 613.810
Advertising device, Toffelmier & Heiron. 614.37
Air compressor governor, Libby & Potter. 613.852
Alarm. C. A. Deal. 613.873
Almond huller, W. G. Read. 613.873
Amalgamator, J. McKelvey et al. 613.784
Amalgamator, J. McKelvey et al. 613.784
Amalgamator and distributer, J. H. Rae. 613.718
Animal shears, H. V. Dunn. 613.973
Animal stears, H. V. Dunn. 613.973
Animal stears, H. V. Dunn. 613.973
Animal stears, H. V. Dunn. 613.973
Bag fastener, C. D. Simmons. 613.825
Bag or satchel frame, W. Roemer. 613.815
Badage, identification, W. S. Richardson. 613.825
Bag or satchel frame, W. Roemer. 613.812
Bandage, umbilical, J. B. Uillon. 613.761
Battery. See Primary battery.
Belt guide, L. Anderson. 613.963
Belt tightener, E. A. Bigelow. 613.963
Belt tightener, F. A. Bigelow. 613.963
Belt tightener, F. A. Bigelow. 613.963
Beverages, manufacture of non-intoxicating, E. Uhlmann. 613.915
Beverages, manufacture of non-intoxicating, E. Bicycle, M. J. Steffens. 613.72
Bicycle, M. J. Steffens. 613.73
Bicycle chains, apparatus for cleaning, etc., W. J. Baldwin. 613.893
Bicycle chains, apparatus for cleaning, etc., W. J. Baldwin. 613.893
Bicycle chains, apparatus for cleaning, etc., W. J. Baldwin. 613.893
Bicycle chains, apparatus for cleaning, etc., W. J. Baldwin. 613.893
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Bicycle chains, apparatus for cleaning, etc., W. J. Baldwin. 613.893
Bicycle chains, apparatus for cleaning, etc., W. J. Baldwin. 613.893
Bicycle bandle bar, adjustable, E. H. Fredrick. 613.893
Bicycle bandle bar, adjustable, E. H. Fredric ard. See Cribbage oca... bound board. iller. See Steam boiler. Water tube boiler. ampers. For other rates per square inch the carrying are taken up in order, and informationis given expecting capacity would be in the same proportion.

(7519) H. S. asks: 1. How long does it it is to produce a vacuum or a high state of rarefaction in a common if candle power incandescent light globe by a Bunsen pump that is connected to faucet of city water supply? A. A high vacuum cannot be produced with a Bunsen pump that is connected to faucet of city water supply? A. A high vacuum cannot be produced with a Bunsen pump in this way. The space will always contain water vapor. 2. Can pot give met he number of cubic understance that is a contain length of this by above mentioned pump? A. The rate of exhaustion depends upon the size of the pump as compared with the space to ce exhausted. Bunsen and Sprengel pumps are, of necessity, of small bore, and therefore show in action. We doubt if any figure for amount of air removed can be given which would be reisable. 3. What is the best way to make a hole of cretain size, says half an inch, in a large glass bottle without receiving fractures? A. To drill a hole in a glass bottle with the book or point points and the refore all the produced size with a count of air removed can be given which would be reisable. 3. What is the best way to make a hole of cretain size, says half an inch, in a large glass bottle with the book or point points and the refore and the refore all the pump and the results. The proof is the produced and the produced produced and the reformation of the removed can be given which would be reisable. 3. What is the best way to make a hole of cretain size, says half an inch, in a large glass bottle with the booken point of a fle, water has been as the produced produced by the produced produced produced produced produced produced produced produced produced Boiler.

| | 333 | |
|------------------|---|--|
| 1 | Car coupling, W. B. Lyon | 613,696 613.672 |
| | Car coupling, W. B. Lyon. Car guard, open, C. H. Fogg. Car life saving apparatus, street, H. W. Libbey. Car wheels, etc., apparatus for removing, J. Bryan. | 613,691 |
| | Cars, ball bearing center plate for, C. B. Royal Carriage gear, A. W. Knight Carrier. See Cuspidor carrier. Package carrier. Cart, refuse, C. Rosenfeld | 613,803 |
| | Cart, refuse, C. Rosenfeld | 613,925 613,988 |
| - | Castings, machine for cleaning, W. C. McKeown. Chain cover. power transmitting, B. L. Toquet Chair. See Extension chair. | 613,707 614,008 |
| 1 | Channel Haps, tool for cutting and crimping, F. A. Whiting Chart, registry, J. P. Beardail Chart, registry, J. P. Beardail | 613,895 613,655 613,070 |
| | Chair. See Extension chair. Channel flaps, tool for cutting and crimping, F. A. Whiting. Chart, registry, J. P. Beardail. Checking device, E. C. Eaglesfield. Chimney protector. W. Van Gaasbeek. Cigar buuching machine, A. Frank. Clamp. See Blcycle handle bar clamp. Clasp. See Garment clasp. Cleaner. See Cutton cleaner. Window cleaner. | 613.740 613,983 |
| | Clasp. See Garment clasp. Cleaner. See Cotton cleaner. Window cleaner. Clinometer, R. J. & J. F. Schneider | 613,782 |
| | Cleaner. See Cotton Cleaner. Window Cleaner. Clinometer, R. J. & J. F. Schneider. Clothes fastener, W. H. Orr. Clutch, E. H. Hodgkinson. Clutch apparatus, L. Megy. Coal cutting machine, W. E. Garforth. Coal, etc., eliminating impurities from, E. M. Eidberr. | 613,710 613,766 613,702 |
| | Coal, etc., eliminating impurities from, E. M. Eidherr. Coal furnace, powdered, Peck & Patterson. | 613,980 613,937 |
| | Cosi. etc., enim nating impurities from, E. M. End- herr. Coal furnace, powdered, Peck & Patterson. Connector, F. E. Case. Conveying and boisting apparatus, J. F. Ward. Cooking or baking pies, etc., apparatus for, T. F. & J. H. Braime. | 613,663 613,820 614,044 |
| | Cooking or baking pies, etc., apparatus for, T. F. & J. H. Braime | 613,752 613,789 |
| | Cooking or baking pies, etc., apparatus for, T. F. & J. H. Braime. Corking machine, Armstrong & Knights Corn conveyer, F. Gahm Corn conveyer, F. Gahm Cotton cleaner, seed. E. Hart Coupling, See Car coupling, Harness strap coupling. Thill coupling device, A. A. Pope Creel frame, J. P. Cronin Cribbage board, Ross & Reid Cuff holder, J. F. Harrison Cuff holder, J. F. Harrison Cultivator, garden, G. W. Rose Cultivator planter attachment, wheel, J. M. Homesley Cuspidor carrier, C. C. Coriew Cutter. See Fodder cutter Cycle chain wheel, L. J. Wentzel Cycle caing or exercising machine, Bones & Hart Lental articulator, J. W. Moffit. | 613,676 613,993 |
| | ling. Thill coupling. Coupling unlocking device, A. A. Pope Creel frame, J. P. Cronin | 613,715 613,760 |
| | Cribbage board, Ross & Reid. Cuff holder, J. F. Harrison. Cuff holder, C. V. Richards. | 614,028 613,816 614,026 |
| | Cultivator planter attachment, wheel, J. M. Homesley | 613,995 613,973 |
| | Cutter. See Fodder cutter. Cycle chain wheel, L. J. Wentzel Cycle mud guard, H. Kiddier | 614,045 614,007 |
| | Dental chair bracket attachment I A W Lund. | 020,112 |
| | Dorgen Dental matrix retainer, J. M. Strout Direct acting engine, J. P. Simmons | 613,842 613,947 613,806 |
| | Dispensing case, J. W. Hutchinson et al Display rack and measurer. Morrison & Tracy Dividers or Compasses, F. Benes | 614,000 613,931 613,814 |
| | Dividers or compasses, F. Benes. Door lock, J. Jackson. Double action jack, E. T. Trefethen. Draught regulator, damper, and ventilator, combined E. V. Coulston. | 613,919 |
| 1 | Double action jack, E. T. Trefethen. Draught regulator, damper, and ventilator, combined, E. V. Coulston. Draughting system, dress, M. Goodhue. Drilling machine, J. A. Wilson. Dye and making same, green-blue soluble, H. Gutzkow. Dye and making same, red rhodamin, C. Hoffmann. | 613,988 613,748 |
| 7 | Gutzkow. Dye and making same, red rhodamin, C. Hoff- mann. Dye and making same, vollow C. Rie | 613,920 613,926 |
| • | mann Dye and making same, yello w. C. Ris. Dyeing apparatus, hat, J. W. Wigner. Dynamo and electric motor for driving vehicles, J. V. Sherrin. | 614,047 |
| | J. V. Sherrin. Electric circuit controller, N. Tesla. Electric energy, generating and distributing, C. M. Green | 613,735 613,882 |
| | Electric machine brush holder dynamo G L | 010,510 |
| 1 | Pratt. Electric motor controlling device, F. J. Russell Electric regulator, W. H. Chapman. Electric switch, F. A. La Roche. Elevator, J. H. Rowan. | 614,025 613,869 613,853 |
| | Electric switch, F. A. La Roche. Elevator, J. H. Rowan. Elevator gate, G. E. De Vore. | 613,688 613,942 613,878 |
| | Elevator, J. H. Rowan Elevator gate, G. E. De Yore. Elevator safety device, F. Blanding. Engine. See Direct acting engine. Fluid pres- sure engine. Gas engine. Rotary engine. Engine, W. E. Prall. Engine, Starting or reversing mechanism for | 613,939 |
| | Engines, starting or reversing mechanism for steam G. Schuhmann. Evaporating pan, W. E. Shoales. Extension chair, J. G. Bulkley | 613,783 613,892 613,964 |
| | Fan and pump for propelling air, etc., screw, C. A. Parsons. Fastener, separable, G. E. Adams. | |
| | Fance machine cutting and holding attachment | 613,829 |
| | E. C. Mathews. Firearm attachment, M. Mattson Firearm sight, C. J. Stenman. Firearm trigger mechanism, J. West. Fire escape, H. C. Hansen. | 614,019 613,893 613,872 613,764 |
| | Fire escape, H. C. Hansen. Fire escape, H. Viereg. Fireplace, portable, G. Weibel. Fireprocling, composition of matter for, H. Rous Fish net lines, machine for casting leads on, E. | 613,764 614,043 613,745 613,941 |
| | Fish net lines, machine for casting leads on, E. Manula. Flashlight apparatus, Alter & Young. Flasks, etc., top for, C. Webster Flower or other stand, J. R. Gadbury. Flower stand, adjustable, J. R. Gadbury. Flue scraper, E. D. Weston. Fluid pressure erRine, F. W. Lanchester. Fodder cutter, J. Dick. | 613,863 613,955 613,850 |
| 0 7 2 7 | Flower or other stand, J. R. Gadbury Flower stand, adjustable, J. R. Gadbury Flue scraper, E. D. Weston | 613,986 613,985 613,746 613,769 |
| 7 6 8 | Fluid pressure erkine, F. W. Lanchester Fodder cutter, J. Dick Folding box, W. E. Keeler Food compound and making same, E. Hantke | 613,769 613,668 614 005 613,765 |
| 8 6 5 | Foot support, R. T. Jones | 613,904 |
| 5 3 6 2 | Fruit packing package, ventilated, F. C. Stettler Furnace. See Boiler furnace. Coal furnace. Gas heated furnace. Ore treating furnace. Smelt- | 614,033 |
| 690 | ing furnace. Furnace, E. Brook | 613.658 |
| 6 | Game board, J. E. Beman | 613.876 613,890 |
| 5 6 3 2 | Gas burners, air regulating device for atmospheric, J. N. Webb. Gas burners, apparatus for freeing, lighting, or extinguishing. P. Guyenot. Gas engine, H. G. Carnell. | 613,871 613,990 613,757 613,790 |
| 5 9 3 | Gas generator, acetylene, Beucus & Black Gas generator, acetylene, Couper & Byran (re- issue) | 613,790 11,701 |
| 7 | Gas generator, acetylene, Couper & Byran (re- issue). Gas generator, acetylene, E. J. Gellenbeck, Gas generator, acetylene, F. Ginnasi. Gas generator, acetylene, F. Ginnasi. Gas generator, acetylene, C. P. Lesher. Gas heated furnace, C. Bond. Gas machine, W. L. Ratisseau. Gas meters, combined excess and back pressure check for, W. B. Hoyt. | 613,976 613,879 613,901 |
| 3 4 7 7 | Gas heated furnace, C. Bond | 613,961 613,720 |
| 7 5 3 6 | Gas returts, apparatus for charging inclined, A. | 613,681 613,854 |
| | Gate. See Automatically opening gate. Elevator gate. Mine gate. Swinging gate. Generator. See Gas generator. Glass polishing machine, plate, Friske & Kas- | |
| 8 5 | | 613,984 613,847 613,945 |
| 66 | Glove, R. Rue Glove, baseball. B. F. Shibe Governor, marine, J. T. Austin. Grinding machine, C. H. Norton Gun sight, blow. H. Rahn Guns, bearing for trunnions of heavy, D. Vickers | 613,875 613,984 613,823 |
| 4 2 7 | Guns, wiper rod holding attachment for. D. L. | 614,042 613,860 |
| 7 | Handle. See Casket handle. Handle bar, adjustable, W. J. Christy | 613,970 |
| 1 7 9 | Hanger bolt, V. & K. McCreery | 613,933 613,989 613,975 |
| 5 | Harvester bundle carrier, sorn, C. S. Sharp | 614,065 614,066 613,738 |
| 1 | Hides or skins, treating and tanning, Millar & | |