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 Incine-

rating 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 Defiance Machine Works, Defiance, Ohio, U. S. A.

The celebrated "Hornsby-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Refrigerating Machine Company. Fort 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 10c for a 24 page pamphlet, containing a list of questions asked by an examining board of engineers. Address Geo. A. Zeller, Bookseller.

Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway New York. Free on application.



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 This is for our information and not for publication.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

References to former articles or answers should give date of paper and page or number of question.

Inquirles 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.

bouses 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. Price 10 cents each.

Books referred to promptly supplied on receipt of

Winerals 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 Ger man 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 re sult by 9.69, which gives 32 ohms nearly. Similarly, the resistance of the German sllver 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 Grav's "Physical Tables." Smithsonian 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 amperes 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, 0.64 ampere; No. 20, 0.00 ampere; No. 18, 1.28 amperes. For other rates per square inch the carrying capacity would be in the same proportion.

(7519) H. S. asks: 1. How long does it take to produce a vacuum or a high state of rarefaction in a common 16 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 in this way. The space will always con tain water vapor. 2. Can you give me the number of cubic inches rarefled in a certain length of time by above mentioned pump? A. The rate of exhaustion depends upon the size of the pump as compared with the space to be exhausted. Bunsen and Sprengel pumps are, of necessity, of small bore, and therefore slow in action. We doubt if any figure for amount of air removed can be given which would be reliable. 3. What is the best way to make a hole of certain size, say half an inch, in a large glass bottle without receiving fractures? A. To drill a hole in a glass bottle use the broken point of a file, wet ting it with a solution made by dissolving camphor in turpentine. Have care not to bear on too hard when the drill is nearly through. Enlarge the hole to required size with a round file wet with the same solution.

(7520) L. A. W. asks: Will you please

or at least for a long time? A. Water, 1 quart; alum, 34 ounce. 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 equal amount 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 corro sion of the metallic parts or by the drying of the pasts in them. You can see if there has been corrosion. If the paste is dry, you can bore a hole through the top and but some water into the cell. After it has soaked a day or two, pour the remaining 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 Com-pany. 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 academy, 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 me chanics 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 pres ent 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 ex cellent engravings 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 Or-ganic Chemicals and Products employed in the Arts, Manufactures, Medicine. With Concise Methods for the Detection and Determination of their Impurities. Adulterations, and Alfred H. Allen. Second edition revised and enlarged. Vol. IV. Proteids and Albuminous Principles, Proteoids or Albuminoids. Philadelphia: P. Blakiston's Son & Company. 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 Envalve Gear, and the Care and Management of Corliss Steam Engines. By F. W. Shillitto, Jr. Bridgeport, Conn.: The American Industrial Publishing Company. 1898. Pp. 294 Price 21 224. Price \$1.

The demand for an elementary treatise on the Corliss 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 illustrated, but the illustrations do not show up as well as they might, as the paper has an unfortunate bluish tinge.

SHEWEY'S OFFICIAL HANDY REFERENCE POCKET ATLAS AND CYCLOPEDIA. Chicago: A. C. Shewey. 1898. Pp. 94. Price 25 cents.

THE UNIVERSALIST REGISTER. Statistics of the Universalist Church and Other Denominational Informa-Richard Eddy. D.D. Boston: Universalist Publishing House, 1898.

Pp. 120. Price 20 cents.

LUS. For Technical Schools and Colleges. By P. A. Tamber DIFFERENTIAL AND INTEGRAL CALCUleges. By P. A. Lambert, M.A. New York: The Macmillan Company. London: Macmillan & Company, Limited. 1898. Pp. 245. Price \$1.50.

The object of this text book is three-fold; by a logical presentation of principles to inspire confidence in the advise through the columns of your valuable paper a formula for a flour paste, one that will keep indefinitely,

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. Philadelphia: 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 he 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 iu 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 procurring 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. Winnikes Advertising device, Toffelmier & Heiron Air compressor governor, Libby & Potter	
anism, combined carbonic, R. Winnikes	613.810
Advertising device, Toffelmier & Heiron	614.037
Air compressor governor, Libby & Potter Alarm, C. A. Deal. Almond builer, W. G. Read. Amalgamator, J. McKelvey et al. Amalgamator, J. McKelvey et al. Amalgamator and distributer, J. H. Rae. Animal shears, H. V. Dunn. Animal shears, H. V. Dunn. Animal shears, H. V. Dunn. Bag fastener, C. E. Weeden. Bag fastener, C. D. Simmons. Bag or satchel frame, W. Roemer. Bandage, umbilical, J. B. Dillon. Battery, See Primary battery. Belt guide, L. Anderson. Belt, skirt supporting, H. Vallenius.	613,692
Alarm, C. A. Deal	613,877
Almond huiler, W. G. Read	613,867
Amalgamator, J. McKelvey et al	612 710
Animal abourg H V Dunn	613 478
Animal tran G. F. Weeden	613 916
Automatically opening gate or door, C. A. Elias.	613.815
Badge, identification, W. S. Richardson	613,723
Bag fastener, C. D. Simmons	613,826
Bag or satchel frame, W. Roemer	613,912
Bandage, umbilical, J. B. Dillon	613,761
Battery. See Primary battery.	010 OF 0
Belt guide, L. Anderson, L. Vallenius. Belt, skirt supporting, H. Vallenius. Belt tightener, E. A. Bigelow. Belt tightener, J. P. Theisen. Beverases, manufacture of non-intoxicating, E.	612 720
Polt tightones F. A. Pigolow	613 060
Rolt tightener I. P. Theisen	613 736
Beverages, manufacture of non-intoxicating, E.	010,100
Uhlmann	613,915
Bicycle, H. McDonald	613,886
Bicycle, T. E. J. Schaibly	613,943
Bicycle, M. J. Steffens	613,732 613.965
Beverages, manufacture of non-intoxicating, E. Uhlmann. Bicycle, H. McDonald	613.965
Bicycle brake, A. Page	613,909
Bicycle chains, apparatus for cleaning, etc., w.	612 022
Ricycle driving gear W W Annable	614 071
Bicycle gear, G T. Martin	613,697
Bicycle gearing, W. T. Branitzky	613,753
Bicycle handle bar, adjustable, E. H. Fredrick	613,673
Bicycle handle bar clamp. W. G. Jones	614,004
Bicycle pedal toe clip, A. W. Ashworth	613,957
Bicycle saddle, J. A. Hunt	613,927
Ricycle support, M. Gutowitz	613,675
Billiard out tin II A Kannada	614,000
Board See Cribberg board Game board Metal	014,000
Bicycle chains, apparatus for cleaning, etc., W. J. Baldwin. Bicycle driving gear, W. W. Annable. Bicycle gear, G. T. Martin. Bicycle gearing, W. T. Branitzky. Bicycle pandle bar, adjustable, E. H. Fredrick. Bicycle pedal toe clip, A. W. Ashworth. Bicycle pedal toe clip, A. W. Ashworth. Bicycle saddle, J. A. Hunt. Ricycle support, M. Gutowitz. Bicycle transporting frame, P. Neumann. Billiard cue tip, H. A. Kennedy. Board. See Cribbage board. Game board. Metal bound board.	
Poilar Cas Steam boilar' Water tube beiler	
boner. See Steam boner. water tube boller.	
Boiler. See Steam boiler. Water tube boiler. Boiler furnace, M. A. Castoe	613.968
Boiler furnace, M. A. Castoe	613.968 613,785
Boiler furnace, M. A. Castoe	613.968 613,785
Boiler furnace, M. A. Castoe	613.968 613,785 613.660
Boiler furnace, M. A. Castoe. Boiler furnace, steam, H. Sieben. Boiler furnace, steam, H. Sieben. Boiler furnace, steam, H. Sieben. Bottle See Hanger bolt. Bottle closure, S. K. Dennis.	613.968 613,785 613.660 613.836
Boiler furnace, M. A. Castoe	613,968 613,785 613,660 613,836 614,056
Boiler furnace, M. A. Castoe Boiler furnace, steam, H. Sieben Bottle stopper, A. Lamontagne, Jr. Box. See Rolding box. Letter box. Mail box. Box. C. B. Scott.	613.968 613,785 613.660 613.836 614.056 613.784
Boiler furnace, M. A. Castoe. Boiler furnace, steam, H. Sieben Boiler furnace, steam, H. Sieben Boiler Sterner boit. Boring tool, F. Brunner Bottle closure, S. K. Dennis. Bottle stopper, A. Lamontagne, Jr. Box. See Kolding box. Letter box. Mail box. Box. C. B. Scott. Box fastener, H. Alberswerth.	613,968 613,785 613,660 613,836 614,056 613,784 613,812
Boiler furnace, M. A. Castoe. Boiler furnace, steam, H. Sieben. Boiler furnace, steam, H. Sieben. Boit. See Hanger boit. Borting tool, F. Brunner. Bottle closure, S. K. Dennis. Bottle stopper, A. Lamontagne, Jr. Box. See Folding box. Letter box. Mail box. Box, C. B. Scott. Box fastener, H. Alberswerth. Brake. See Bicycle brake. Car brake.	613,968 613,785 613,660 613,836 614,056 613,784 613,812
Boiler furnace, M. A. Castoe. Boiler furnace, steam, H. Sieben Boiler furnace, steam, H. Sieben Boit. See Hanger boit. Boring tool, F. Brunner. Bottle closure, S. K. Dennis. Bottle stopper, A. Lamontagne, Jr. Box. See Folding box. Letter box. Mail box. Box, C. B. Scott. Box fastener, H. Alberswerth. Brake, See Bicycle brake. Car brake. Brake sboe key. W. D. Sargent.	613,968 613,785 613,660 613,836 614,056 613,784 613,812 613,887
Boiler furnace, M. A. Castoe. Boiler furnace, steam, H. Sieben Boiler furnace, steam, H. Sieben Boit. See Hanger boit. Boring tool, F. Brunner. Bottle closure, S. K. Dennis. Bottle stopper, A. Lamontagne, Jr. Box See Folding box. Letter box. Mail box. Box, C. B. Scott. Box fastener, H. Alberswerth. Box fastener, H. Alberswerth. Brake, See Bicycle brake. Car brake. Brake aboe key, W. D. Sargent. Brick kiln, W. F. Cook.	613.968 613,785 613.660 613.836 614.056 613,784 613,812 613,887 613,664
Boiler furnace, M. A. Castoe. Boiler furnace, steam, H. Sieben. Boiler furnace, steam, H. Sieben. Boiler furnace, steam, H. Sieben. Bott. See Hanger bolt. Boring tool, F. Brunner. Bottle closure, S. K. Dennis. Bottle stopper, A. Lamontagne, Jr. Box. See Folding box. Letter box. Mail box. Box. C. B. Scott. Box fastener. H. Alberswerth. Brake. See Bicycle brake. Car brake. Brake shoe key. W. D. Sargent. Brick kiln, W. F. Cook. Bronzing machine, Emmerich & Vonderlehr.	613,968 613,785 613,660 613,836 614,056 613,784 613,812 613,887 613,664 613,857
Boiler furnace, M. A. Castoe. Boiler furnace, steam, H. Sieben Boiler furnace, steam, H. Sieben Boit. See Hanger boit. Boring tool, F. Brunner. Bottle closure, S. K. Dennis. Bottle stopper, A. Lamontagne, Jr. Box. See Folding box. Letter box. Mail box. Box. C. B. Scott. Box fastener. H. Alberswerth. Brake. See Bicycle brake. Car brake. Brake aboe key, W. D. Sargent. Brick kiln, W. F. Cook. Bronzing machine, Emmerich & Vonderlehr. Bronze composition and making same, A. Schewn-	613,968 613,785 613,660 613,836 614,056 613,784 613,812 613,887 613,664 613,857
Boiler furnace, M. A. Castoe. Boiler furnace, steam, H. Sieben. Boiler furnace, steam, H. Sieben. Boiler furnace, steam, H. Sieben. Bott. See Hanger bolt. Boring tool, F. Brunner. Bottle closure, S. K. Dennis. Bottle stopper, A. Lamontakne, Jr. Box. See Folding box. Letter box. Mail box. Box. C. B. Scott. Box fastener. H. Alberswerth. Brake. See Bicycle brake. Car brake. Brake shoe key. W. D. Sargent. Brick kiln, W. F. Cook. Bronzing inachine, Emmerich & Vonderlehr. Bronze composition and making same, A. Schewnterly.	613,968 613,785 613,660 613,836 614,056 613,784 613,812 613,887 613,664 613,857
Boiler furnace, M. A. Castoe. Boiler furnace, steam, H. Sieben. Boiler furnace, steam, H. Sieben. Boiler furnace, steam, H. Sieben. Boil. See Hanger bolt. Boring tool, F. Brunner. Bottle closure, S. K. Dennis. Bottle stopper, A. Lamontagne, Jr. Box. See Folding box. Letter box. Mail box. Box. C. B. Scott. Box fastener. H. Alberswerth. Brake. See Bicycle brake. Car brake. Brake shoe key, W. D. Sargent. Brick kiln, W. F. Cook. Bronzing machine, Emmerich & Vonderlehr. Bronzing machine, Emmerich & Vonderlehr. Bronze composition and making same, A. Schewnterley. From head, A. W. Fitts.	613,968 613,785 613,660 613,836 614,056 613,784 613,812 613,887 613,664 613,857
Boiler furnace, M. A. Castoe. Boiler furnace, M. A. Castoe. Boiler furnace, steam, H. Sieben. Boiler furnace, steam, H. Sieben. Boiler furnace, M. A. Castoe. Boiler furnace, M. Brunner. Bottle Closure, S. K. Dennis. Bottle closure, S. K. Dennis. Bottle stopper, A. Lamontakne, Jr. Bottle stopper, A. Lamontakne, Jr. Box. See Folding box. Letter box. Mail box. Box. G. B. Scott. Box fastener, H. Alberswerth. Brake See Bicycle brake. Car brake. Brake Aboe key. W. D. Sargent. Brick kiln, W. F. Cook. Bronking machine, Emmerich & Vonderlehr. Bronze conposition and making same, A. Schewnterley. Bronk M. W. Fitts. Bronk, Smith & Atwater. Bronk, Smith & Atwater.	613,968 613,785 613,660 613,836 614,056 613,784 613,812 613,887 613,664 613,857
Boiler furnace, M. A. Castoe. Boiler furnace, steam, H. Sieben Boiler furnace, steam, H. Sieben Boit. See Hanger boit. Boring tool, F. Brunner. Bottle closure, S. K. Dennis. Bottle closure, S. K. Dennis. Bottle stopper, A. Lamontagne, Jr. Box. See Folding box. Letter box. Mail box. Box., C. B. Scott. Box. C. B. Scott. Brake. See Bicycle brake. Car brake. Brake. See Bicycle brake. Car brake. Brake See Bicycle brake. Car brake. Brake Shoe key, W. D. Sargent. Brick kiln, W. F. Cook. Bronzing machine, Emmerich & Vonderlehr. Bronzing machine, Emmerich & Vonderlehr. Bronze composition and making same, A. Schewnterley. Broom head, A. W. Fitts. Brush Brush & Akwater. Brush holder, A. E. Doman. Brush Dailt. J. E. Murphy.	613,968 613,785 613,660 613,836 614,056 613,784 613,812 613,887 613,664 613,857
Boiler furnace, M. A. Castoe. Boiler furnace, esteam, H. Sieben Boiler furnace, M. A. Castoe. Boiler furnace, steam, H. Sieben Boit. See Hanger boit. Boring tool, F. Brunner. Bottle closure, S. K. Dennis. Bottle closure, S. K. Dennis. Box. See Folding box. Letter box. Mail box. Box. C. B. Scott. Box. C. B. Scott. Box fastener, H. Alberswerth. Brake. See Bicycle brake. Car brake. Brake shoe key, W. D. Sargent. Brick kiln, W. F. Cook. Bronzing inachine, Emmerich & Vonderlehr. Bronze composition and making same, A. Schewnterley. Broom head, A. W. Fitts. Brush, Smith & Atwater Brush, Boilder, A. E. Doman. Brush, paint, J. E. Murphy. Buckle, A. & & T. S. Grace.	613,968 613,785 613,660 613,836 614,056 613,784 613,812 613,887 613,664 613,857
Boiler furnace, M. A. Castoe. Boiler furnace, steam, H. Sieben Boiler furnace, steam, H. Sieben Boit. See Hanger boit. Boring tool, F. Brunner. Bottle closure, S. K. Dennis. Bottle closure, S. K. Dennis. Bottle stopper, A. Lamontagne, Jr. Box. See Folding box. Letter box. Mail box. Box., C. B. Scott. Box fastener, H. Alberswerth. Brake. See Bicycle brake. Car brake. Brake Shoe key, W. D. Sargent. Brick kiln, W. F. Cook. Bronzing inachine, Emmerich & Vonderlehr. Bronzing inachine, Emmerich & Vonderlehr. Bronze composition and making same, A. Schewnterley. Broom head, A. W. Fitts. Brush, Smitb & Atwater Brush holder, A. E. Doman. Brush, Paint, J. E. Murphy. Buckle, A. A. & T. S. Grace. Buckle, lock, M. W. Lynch.	613,968 613,785 613,660 613,836 614,056 613,784 613,812 613,887 613,664 613,857
Boiler furnace, M. A. Castoe. Boiler furnace, steam, H. Sieben Boiler furnace, steam, H. Sieben Boit. See Hanger boit. Boring tool, F. Brunner. Bottle closure, S. K. Dennis. Bottle stopper, A. Lamontagne, Jr. Box. See Rolding box. Letter box. Mail box. Box. C. B. Scott. Box fastener. H. Alberswerth. Brake. See Bicycle brake. Car brake. Brake. See Bicycle brake. Car brake. Brake See Bicycle brake. Car brake. Brake Shoe key. W. D. Sargent. Brick kiln, W. F. Cook. Bronzing machine, Emmerich & Vonderlehr. Bronze composition and making same, A. Schewnterley. Broom head, A. W. Fitts Brush, Smith & Atwater Brush paint, J. E. Murphy. Buckle, A. & & T. S. Grace. Buckle, lock, M. W. Lynch. Buggy top, J. C. Byxbe.	613,968 613,785 613,660 613,836 614,056 613,784 613,812 613,887 613,664 613,857
Boiler furnace, M. A. Castoe. Boiler furnace, steam, H. Sieben Boiler furnace, steam, H. Sieben Boil. See Hanger bolt. Boring tool, F. Brunner. Bottle closure, S. K. Dennis. Bottle closure, S. K. Dennis. Bottle stopper, A. Lamontagne, Jr. Box. See Folding box. Letter box. Mail box. Box. C. B. Scott. Box fastener, H. Alberswerth. Brake. See Bicycle brake. Car brake. Brake Shoe key, W. D. Sargent. Brick kiln, W. F. Cook. Bronzing machine, Emmerich & Vonderlehr. Bronzing inachine, Emmerich & Vonderlehr. Bronze composition and making same, A. Schewnterley. Broom head, A. W. Fitts. Brush, Smith & Alwater. Brush holder, A. E. Doman. Brush, Paint, J. E. Murphy. Buckle, A. A. & T. S. Grace. Buckle, lock, M. W. Lynch. Buggy top, J. C. Byxbe. Burial casket, I. Hammel.	613,968 613,785 613,660 613,836 614,056 613,784 613,812 613,887 613,664 613,857
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	Car coupling, W. B. Lyon	613,696 613,672 613,691
1		
)	Bryan Cara, ball bearing center plate for, C. B. Royal. Carriage gear, A. W. Knight Carrier. See Cuspidor carrier. Package carrier. Cart, refuse, C. Rosenfeld. 613,779,	613,803
,	Case. See Dispensing case.	614 095
7	Chain cover, power transmitting, B. L. Toquet	614,058
	Channel flaps, tool for cutting and crimping, F. A. Whiting	613.895
	Channel flaps, tool for cutting and crimping, F. A. Whiting. Chart, registry, J. P. Beardall Checking device, E. C. Eaglesfield. Chimney protector. W. Van Gaasbeek. Cigar bunching machine, A. Frank. Clamp. See Bleycle handle bar clamp.	613,979 613,740
-	Clasp. See Garment clasp.	613,983
8	Cleaner. See Cotton Cleaner. Window cleaner. Clinometer, R. J. & J. F. Schneider. Clothes fastener, W. H. Orr.	613,782 613,710
8	Clamp. See Bicycle handle bar clamp. Clasp. See Bicycle handle bar clamp. Clasp. See Garment clasp. 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. Eidherr.	613,766 613,702 613,987
i f	Coal, etc., eliminating impurities from, E. M. Eidherr. Coal furnace, powdered, Peck & Patterson. Connector, F. E. Case. Converter, T. Levoz. Conveying and hoisting apparatus. J. F. Ward. Cooking or baking pies, etc., apparatus for, T. F. & J. H. Braime. Corking machine, Armstrong & Knights. Corn conveyer, F. Gahm. Corn shredder, F. Hagen. Cotton cleaner, seed, E. Hart. Coupling. See Car coupling. Harness strap coupling. Thill coupling.	613,980 613,937
e e	Connector, F. E. Case. Converter, T. Levoz. Conveying and hoisting apparatus. J. F. Ward	613,663 613,820 614,044
	Cooking or baking pies, etc., apparatus for, T. F. & J. H. Braime	613,752 613,789
,	Corn conveyer, F. Gahm. Corn shredder, F. Hagen. Cotton cleaner, seed, E. Hart.	613,762 613,676 613,993
	Coupling. See Car coupling. Harness strap coupling. Thill coupling. Coupling unlocking device, A. A. Pope. Creel frame, J. P. Cronin. Cribbage board, Ross & Reid. Cuff holder, J. F. Harrison. Cuff holder, C. V. Richards. Cultivator, garden, G. W. Rose. Cultivator planter attachment, wheel, J. M. Homesley. Cuspidor carrier. C. C. Corlew. Cutter. See Fodder cutter.	613,715
c	Criel frame, J. P. Cronin. Cribbage board, Ross & Reid. Cuff holder, J. F. Harrison.	613,760 614,028 613,816
1	Cultivator, garden, G. W. Rose	614,026 614,027
y	Homesley. Cuspidor carrier. C. C. Corlew. Cutter. See Fodder cutter.	613,995 613,973
8	Homesley. Cuspidor carrier. C. C. Corlew. Cutter. See Fodder cutter. Cycle chain wheel, L. J. Wentzel. Cycle mud guard, H. Kiddier. Cycle racing or exercising machine, Bones &	614,045 614,007
1	Пагь	613,962 613,772
	borg. Dental matrix retainer, J. M. Strout	613,842 613,947 613,806
,	oorg. Dental matrix retainer, J. M. Strout. Direct acting engine, J. P. Simmons	614,000 613,931 613,814
8	Double action jack, E. T. Trefethen. Draught regulator damner and ventilator com-	614,052 613,949
f		613,835 613,988 613,748
i	Dve and making same red rhodomin C Hoff.	613,920
e	mann. Dye and making same, yellow, C. Ris. Dyeing apparatus het I Wigner	613,926 613,911 614 (47
	mann. Dye and making same, yellow, C. Ris. Dyeing apparatus, hat, J. W. Wigner. Dynamo and electric motor for driving vehicles, J. V. Sherrin. Electric circuit controller, N. Tesla.	613.894 613,735
	Electric energy, generating and distributing, C. M. Green. 613,889 to Electric lighting, phosphorescent, D. M. Moore. Electric lighting system for vehicles, Chamberlain & Hubbard.	613,882
1 8	Electric lighting system for vehicles, Chamber- lain & Hubbard	613,918
8	Electric machine brush holder, dynamo, G. L. Pratt. Electric motor controlling device, F. J. Russell	614,025 613,869
t	Electric switch, F. A. La Roche. Elevator, J. H. Rowan.	613,688 613,942
1	Elevator gate, G. E. De vore. Elevator safety device, F. Blanding. Engine. See Direct acting engine. Fluid pres-	613,791
	Pratt. Electric machine brush holder, dynamo, G. L. Pratt. Electric motor controlling device, F. J. Russell. Electric regulator, W. H. Chapman. Electric switch, F. A. La Roche. Elevator, J. H. Rowan. Elevator gate, G. E. De Vore. Elevator safety device, F. Blanding. Engine. See Direct acting engine. Fluid pressure engine. Gas engine. Rotary engine. Engines, W. E. Prall. Engines, starting or reversing mechanism for steam, G. Schuhmann.	613,939
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	A. Parsons Fastener, separable, G. E. Adams	613,775 613,874
	A. Parsons. Fastener, separable, G. E. Adams. Fastening device, C. F. Uhlmann. Fence machine cutting and holding attachment, E. C. Mathews. Firearm attachment, M. Mattson	613,700
	Firearm sight, C. J. Stenman Firearm trigger mechanism, J. West	613,893 613,872
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2	Fish net lines, machine for casting leads on, E. Manula.	613,863
0	Manuia Flashlight apparatus, Alter & Young. Flasks, etc., top for, C. Webster Fjower or other stand, J. R. Gadbury. Flower stand, adjustable, J. R. Gadbury. Flue acraper, E. D. Weston. Fluid pressure engine, F. W. Lanchester. Fluedor enter, J. Dick	613,955 613,986
7277	Flue scraper, E. D. Weston	613.746 613.769
6 8 8	Folding box, W. E. Keeler. Food compound and making same, E. Hantke	614 005 613,765
6 5 3	Fluid pressure enkine, F. W. Lanciester, Fodder cutter, J. Dick. Fodding box, W. E. Keeler. Fod compound and making same, E. Hantke. Foot power mechanism, F. Purdy. Foot support, R. T. Jones. Fountain. See Soda fountain. Fruit packing package, ventilated, F. C. Stettler Furnace. See Boiler furnace. Cas hasted furnace, the treating furnace. Small.	613,904
62	Furnace. See Boiler furnace. Coal furnace. Gas heated furnace. Ore treating furnace. Smelt-	614,033
6	Furnace, E. Brook	613,755
9 0 6	Game apparatus. Game board, J. E. Beman. Garment clasp, S. J. Simmons.	613.876 613,890
5 6 3	heated furnace. Ore treating furnace. Smelting furnace. Furnace. E. Brook. Gage. See Mechanic's gage. Game apparatus. W. J. Bourke. Game board. J. E. Beman	613,871
5	Gas generator, a cetylene, Beucus & Black.	613,757 613,790
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333	Gas generator, acetylene, F. Ginnasi. Gas generator, acetylene, C. P. Lesher	613,901 613,689
47753	Gas machine, W. L. Ratisseau Gas meters, combined excess and back pressure	613,720
5 3 6	Gas retorts, apparatus for charging inclined, A. Coze Gate. See Automatically opening gate. Elevator	613,854
	gate. Mine gate. Swinging gate. Generator. See Gas generator. Glass polishing machine, plate, Friske & Kas-	
5	parek. Glove, R. Rue.	613,984 613.847
0 6	parek. 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 et al.	613,875
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7	Guns, wiper rod holding attachment for, D. L. Howard. Handle. See Casket handle. Handle bar, adjustable. W. J. Christy.	
1	Handle bar, adjustable, W. J. Christy	613,903
1 7 9	Handle, rod. and pole coupling, G. B. Hussey Hanger. See Picture hanger. Hanger bolt, V. & K. McCreery Harness strap copping, W. W. Green Harvester, beet. Davis & Eggleston Harvester bundle carrier, sorn, C. S. Sharp Harvester. corn, C. S. Sharp	613,989 613,975 614 (µ:5
24	Harvester, corn, C. S. Sharp	614.(n;6 613,738
1	Miller.	614,057
208	strom	614,015 613 901
6	Horseshoe, P. & J. P. Hoppesch. Horseshoe plate. calked, W. H. Orr. Hose, golf. G. R. Reers	613.883 613.709 613.656
8 5 3	Hydrant D F Luse	613,701
868	manata and and the till the Daison	613.914 613.716
928	Hydrocarbon burner. G. H. Sherman	614,030

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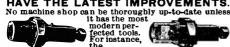
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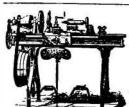
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