

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 following week's issue.

Marine Iron Works. Chicago. Catalogue free. "U. S." Metal Polish. Indianapolis. Samples free. Gasoline Brazing Forge, Turner Brass Works, Chicago. Yankee Notions. Waterbury Button Co., Waterbury, Ct. Handle & Spoke Mch. Ober Lathe Co., Chakring Falls, O. Schwaab Stamp & Seal Co., Milwaukee. Send for cat'g. Small Machine Tools for inventors and experimenters. The Garvin Machine Co., Spring and Varick Sts., N. Y. FERRACUTE Machine Co., Bridgeton, N. J. Full line of Presses, Dies and other Sheet Metal Machinery. Easy Experiments of Organic Chemistry. Book by Prof. Appleton. 50 cents. Snow & Farnham, Providence, R. I. 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. Foot 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. Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway New York. Free on application.

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 This is for our information and not for publication.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. 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. Price 10 cents each. Books referred to promptly supplied on receipt of price. Minerals sent for examination should be distinctly marked or labeled.

(7512) J. H., Jr., asks how to produce hydrogen and oxygen from water by an electric current, also which is the cheapest way to produce hydrogen and oxygen. A. The decomposition of water by the electric current is fully explained in Sloane's "Electrical Toy Making," price \$1 by mail. There is a cut of the apparatus; so you can easily repeat the experiment. The cheapest mode of producing hydrogen is by the action of hydrochloric or sulphuric acid on zinc. The cheapest way to make oxygen is by heating manganese dioxide and potassium chlorate in a retort. These processes are fully described in Remsen's "Chemistry."

(7513) W. J. L. asks: 1. What fluid expands and contracts most by heat and cold? Have been of the opinion that mercury does, as it is used mostly for thermometers. A. There are few, if any, substances, liquid at ordinary temperatures, which expand and contract so little by heat as does mercury. We do not know what liquid expands most; but other stands very near the head of the list in that respect, expanding more than eight times as much as mercury. Mercury is used in thermometers because of its high boiling point (610° Fab.) and low freezing point (39° Fab. below zero). 2. Also kindly inform me if it will expand and contract equally as well if inclosed in brass, iron, or other metals instead of glass. A. Mercury expands just the same in one dish as in another. Its expansion could not be seen except in a transparent dish. Mercury cannot be kept in brass, copper, lead, zinc, tin and others, since it combines with and dissolves them. It can be kept in an iron vessel.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

OCTOBER 18, 1898,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Table listing inventions with patent numbers, including Agricultural boiler, Air brake, Axle, Assurance apparatus, Audiphone, Axle cutter, Axle for cycles, Axle wagon, Baking pan, Band cutter, Barrel cleaner, Barrel, Bearing, Bearing mechanism, Bearing roller, Bearing, Bearing, Bearing, Bed, Beer kegs, Bell, Bicycle, Bicycle brake, Bicycle cyclometer, Bicycle drive, Bicycle driving mechanism, Bicycle governor, Bicycle lamp, Bicycle pedal, Bicycle propelling mechanism.



LITTLE DEMONS OF-WAR

HON. JOHN D. LONG, Secretary of the Navy, will tell the thrilling story of our torpedo-boat service in an early issue of the 1899 volume of

The Youth's Companion

Those who send \$1.75 at once for the 1899 volume will receive FREE all the issues for the remaining weeks of 1898, containing stories by Rudyard Kipling, W. D. Howells, Mary E. Wilkins, and others. The 52 issues of the new year will be of rare variety and charm. These are a few of the

... Good Stories for 1899 ...

- For Life and Liberty, A Boy's Fox-Yard, Police Spies in Russia, How I Went to the Mines, An Esoteric Pig, Henry M. Stanley, John B. Dunn, Poultney Bigelow, Bret Harte, Florence Converse, A Pocketful of Money, The Russian Crusoes, Fifty Years with a Menagerie, In the South, A Night in a Box Car, W. D. Howells, Gen. A. W. Greely, Dan Rice, T. Nelson Page, Hayden Carruth.

The Companion Calendar Free..

New subscribers who will send \$1.75 at once, including this slip or mentioning this paper, will receive THE COMPANION every week from the date of subscription until Jan. 1, 1899, including: FREE - All the remaining issues of 1898, inclusive of the beautiful Double Holiday Numbers. FREE - The exquisite Companion Calendar, lithographed in 12 colors, suitable for the prettiest corner in the house. And THE COMPANION for the 52 weeks of 1899 - a library in itself. E 165

Illustrated Announcement and Sample Copies sent on request.

THE YOUTH'S COMPANION, 201 Columbus Ave., Boston, Mass.

Table listing various mechanical and industrial inventions with patent numbers, including Bicycle saddle, Billiard cushion, Blast furnace, Boat detaching device, Bolt fastening, Bonnet or hat, Bookjack, Boring and turning mill, Bottle, Bottle stopper, Bolt fastener, Brick cleaning machine, Bridges, Bridle bit, Bristle dragging machine, Brominating apparatus, Broom handle coupling, Broom head, Brush cutting machine, Button, Buttonhole opener, Cable stopper, Cake cutting machine, Can opener, Candy, Car coupling, Car door, Car dumping, Car electric self loading street cleaning, Car fender, Car step, Car ventilator and air supplying device, Car Fleming, Car wheel, Cars, flexible uncoupling means for railway, Carboys, Card punching machine, Cards, Carding machine, Cash register, Catalytic material, Cell door locking and indicating mechanism, Chain cover and gear case, Chair, Chair iron, Chairs, ventilated auxiliary seat for, Checkrein holder, Chimney top and ventilator, Chimney top draught regulator, Churn, Cistern cleaner, Claw bar, Cleaning device, Clothes hanger or press, Clothes, hat, and display rack, Clothes rack, adjustable bracket, Clutch, Clutch sprocket, Coat holder, Coffee pot, Coin freed machine, Convertible chair, Copying press, Copying press, Coupling, Crane, Crank and shaft combination, Crate, S. S. Shellhouse, Crutch tip, Cultivator, planter, and fertilizer distributor, Curtain fixture, Cuspidor, Cutlery handle, Cutter, Cutting machine, rotary, Dental chair, Dental engine, Dental fountain cuspidor, Desk, Desulphurizing apparatus, Digger, Discharge thermal, Discharge openings of receptacles, Display device, Door fastener, Doors, corner joint for screen.

Star Screw... cutting Lathes Automatic Cross feed 9 and 11-inch Swing. New and Original Features. Send for Catalogue B. Seneca Falls Mfg. Company, 695 Water St., Seneca Falls, N.Y.

AMERICAN PATENTS. - AN INTERESTING and valuable showing the number of patents granted for the various subjects upon which petitions have been filed from the beginning down to December 31, 1894. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 1002. Price 10 cents. To be had at this office and from all newsdealers.

POWER & FOOT LATHES SHAPERS PLANERS DRILLS MACHINE SHOP OUTFITS TOOLS AND SUPPLIES. CATALOGUE FREE. SEBASTIAN LATHE CO. 120 CULVERT ST. CINCINNATI, O.

TOOLS Every kind of Tool for Steam, Gas, and Water Fitters. Every Tool has our personal guarantee. We have been the Leading Tool Manufacturers for Fifty Years. WALWORTH MFG. CO., 20 OLIVER STREET, BOSTON, MASS.

BARNES' New Friction Disk Drill. FOR LIGHT WORK. Has these Great Advantages: The speed can be instantly changed from 0 to 1600 w/out stopping or shifting belts. Power applied can be graduated to drive, with equal safety, the smallest or largest drills within its range - a wonderful economy in time and great saving in drill breakage. Send for catalogue. W. F. & JNO. BARNES CO., 1999 Ruby St., - Rockford, Ill.

SAVE 1/2 YOUR FUEL By using our (stove pipe) RADIATOR With its 120 Cross Tubes, ONE stove or furnace does the work of TWO. Drop postal for proofs from prominent men. TO INTRODUCE OUR RADIATOR, where we have no active agent we will sell at wholesale price. Write at once. ROCHESTER RADIATOR COMPANY, 82 Furnace St., ROCHESTER, N. Y.

ROCK DRILLS AIR COMPRESSORS SIMPLEST, MOST EFFICIENT AND DURABLE. RAND DRILL CO. Send for Catalogue. 100 Broadway, New York.

Gas Blast Furnaces GAS PRODUCERS AND PRESSURE BLOWERS. For Illustrated Pamphlets, apply to AMERICAN GAS FURNACE CO. 23 John Street, New York, N. Y.

Table listing various mechanical and industrial inventions with patent numbers, including Dredge for mining, Dredging apparatus, Ecraseur, Egg case, Egg holder, Electric cable switch, Electric meter, Electric meter case, Electric meter or indicator, Electric motors, means for controlling operation of, Electrode, battery, Elevator, Elevator, G. P. Mansions, Elevator safety appliance, Elevator safety appliance, Elevator safety appliance, Elevator safety brake, Engine, Engines, igniter or spark for gas, oil, or vapor, Extractor, Stump or tree extractor, Fabric, Fire escape, Fire kindler, Fireproof partition, Fishing tackle swivel, Fly paper, Foods, preparing infant's, Forging machine, Fork, Funnel, Furnace, Fuse, Gage, Gage, Gas burner, Gas burner, incandescent, Gas burner, safety cap, Gas engine, Gas generator, acetylene, Gas generator, acetylene, Gas generator, acetylene, Gas lighters, manufacture of catalytic, Gas meter, coin freed prepayment, Gas tip, Gasket, Gasometer, Gate, Generator, Glass moulding apparatus, Governor, steam engine, Grader, ditcher, and road and levee builder, Grain drill, Grain drill, Grinding mill, Guano distributor, Handle, Harvester, corn, Hat box, Hat forming machine, Hay rack, Hay rake, horse, Heater for water, Hinge, Horse power, Hose machine, Hose spray attachment, Ingots, pouring metal, Insulation of electric conductor wires, system, Ironing machine, Jack, Jar closure, Joint, Kiln or oven, Knob and indicator, combined door, Knob attachment, Lamp burner, Lamp burner, R. J. Wilson, Lamp, electric arc, Lamp socket, electric, Lantern, tubular or hurricane, Last, G. H. Clark, Ledger, loose leaf, Level, Lid holder and kettle drainer, Lifting jack, Liquid dispensing vessel.