

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 This is for our information and not for publication.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.

(7428) I. E. B. asks: How many cubic feet of gas will an apparatus as mentioned in article generate in twenty-four hours and how long will the charge last? Taking such an apparatus as mentioned in article as the base, how large an apparatus would it take to supply ten lights, such as are used in houses, burning eight hours a day? A. The charge for the Adams apparatus as described is from one to two pounds. Each pound pure carbide generates 5 1/2 cubic feet of gas, or 11 1/2 cubic feet for a full charge of 2 pounds. It is not a continuous generator. When the 2 pounds of carbide is exhausted the charge must be renewed. Care must be taken to keep fire away from the apparatus while it is open or being charged. The number of lights the apparatus will supply will depend upon the size of the burners; 10 one foot burners for 8 hours will require 80 cubic feet of gas, which will call for an apparatus seven times larger in capacity than the one illustrated in SCIENTIFIC AMERICAN. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 1057, 1149, 1150, for illustrated articles, 10 cents each mailed.

(7429) C. P. writes: A tank of oxygen was passing down the street. It was of usual size, 4 feet by 14 inches, the pressure about 230 pounds to the square inch, when it exploded, blowing the bottom off and sending the tank through walls, crashing into living apartments. The concussion was so terrible it broke all the windows for half a block, blowing the men in charge into the air, they escaping with shattered clothing and slight injuries. I have hitherto regarded oxygen as harmless and non-explosive. Why this should have exploded after standing three or four days, and after the pressure of the pump and after a little having been used out of it, I do not understand. Have heard that if grease got inside of the tank that it would combine with the oxygen and form a spontaneous combustible gas, but in all my experience I have never met with an accident of this kind and I have been in this business, viz., filling and supplying oxygen and hydrogen tanks of gas, and do not know that there is any truth in the grease theory. A. The bottom of the oxygen tank was blown out by too great a pressure. The oxygen cylinders deteriorate much faster than the hydrogen, since the oxygen rusts the iron or steel and hydrogen does not. Probably this tank was weaker than was supposed, and the jar of carrying it was sufficient to produce the rupture. We do not think any theory of spontaneous combustion necessary. The cylinders should be tested frequently, nor should oxygen ever be put into a cylinder without drying the gas.

(7430) J. C. asks: What is the cause of a bottle of ale or porter freezing in winter when it is very cold, when you draw the cork? What I mean is, on a cold day if you take a bottle of ale, before you draw the cork, it is liquid, and if you take it into a warm room and draw the cork, it immediately freezes solid. A. The sudden freezing of water (ale is not necessary; it is the water in the ale which freezes) under these circumstances is due to cooling it considerably below the freezing point, while it stands quiet. If then it receives a sudden jar, it changes to ice almost instantly, and the temperature of the mass rises to the freezing point. Water has been cooled to 4° Fah. below zero without freezing. It is ready to freeze, but seems unable to begin to freeze. A bit of ice, or any other solid, dropped into the water, will start the particles, and they then jump into the solid form with great rapidity. It is a very pretty experiment.

(7431) C. E. asks: Can the core of an armature be made of aluminum, also the axle of an armature? If not, why? Can you give me any information regarding how light the armature of a 1/2 horse power motor can be made? A. Iron is the only substance of which the core of an armature can be made, since it alone can allow the magnetic lines to flow through it with sufficient ease. The shaft may be made of aluminum, for here strength is the only consideration, but it is not very good material for wear. We do not know what limit of weight has been reached in 1/2 horse power motors.

(7432) G. A. B. asks: What is a formula for preparing paper for use in receiving a telegraphic message by the chemical process? Or what kind of paper is best to use, and what is the best method of treating it chemically, so that an electric current will pass through it and record on it the message? A. Chemically prepared paper for autographic and automatic telegraphy is prepared by soaking it in either of the following solutions: Nitrate of ammonia, 2 pounds; ferricyanide of potassium, 1/2 ounce; gum tragacanth, 2 ounces; glycerine, 2 ounces; water, 1/2 gallon. Or, iodide of potassium, 1/4 pound; bromide of potassium, 1 pound; starch, 1/2 ounce; water, 2 quarts; use any tough unsized paper.

(7433) J. J. R. asks: 1. How can I temper steel for horseshoe magnets, bar magnets and compass needles? A. To temper steel for a magnet, heat the ends of the steel to a red heat and plunge it endwise into cold water. 2. How to give the compass needle the dark blue color at one pole? How are the soft iron armatures of sounders blue? A. A simple method for bluing a small article is to varnish it with a thin shellac

which has been colored with Prussian blue. It is usually done by heating, but this requires some experience and skill. 3. How is hair removed from the body by electricity? A. To remove hair by electricity apply to a skillful physician. The method of doing it is given in "Medical and Surgical Electricity," Beard and Rockwell. Price \$5.50 by mail. 4. Where is telegraphing by electricity without wires treated of? A. For telegraphing without wires, see SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 790, 955, 995, 1131, and SCIENTIFIC AMERICAN, vol. 78, No. 14, 10 cents each.

(7434) T. H. writes: I am using a coil 18 inches long, 2 inches bore, of No. 23 insulated wire, 10 plies; the purpose is to draw an iron object of considerable weight into the coil, requiring a heavy current, but the heating of the coil stands in the way of the experiment. Is there any way of preventing this heating? A. In using a coil as a "sucking coil," the effect depends upon the number of amperes of the current and the number of turns of wire on the coil. The magnetizing power is the product of these two quantities. You are using rather a small number of turns of wire. You would do better to wind twice as many feet of wire on your coil, which will cut the current down and thus reduce the heating effect, while it leaves the magnetic effect the same as before. There is no need to use a coarser wire.

(7435) F. L. B. writes: In SCIENTIFIC AMERICAN of April 9, 1898, is a "Simple Mirror Galvanometer," by Mr. James F. Hobart. Can you tell me where I can find a more minute description of this instrument, that is about the connection of coil, what use is the lamp, how far is lamp from scale, and glass from coil in chimney, what width and length and thickness is coil, what is the use of two needles, how long does the scale have to be, and does the yard stick (if yard stick is used) have to be ruled or divided in any other way other than what it is? A. The minor details of the construction of the mirror galvanometer are such as are common to all such instruments, and hence are not given in our paper. We do not know any description giving full details. It would be very lengthy. We answer your questions. The account tells you to connect the coils in series, that is so that the electricity will go from one on through the other in the same direction, as, for example, with the hands of a clock. The lamp is to furnish a beam of light through the hole in the screen, is reflected from the mirror of the galvanometer back to the scale, where it will show as a bright spot and will move to and fro as the needles of the galvanometer swing under the power of the current. The lamp is only a few inches from the scale; the hand glass is moved to and from till the spot of light on the scale is bright and sharp. The distance of the glass from coil depends on the magnifying power of the glass and must be found by trial. The coils of coils might well be 2 to 3 inches long and 1 inch wide. The size of coils depends on the amount of wire used in them. Two needles placed with opposite poles as shown are more sensitive than one would be. The scale may be about 20 inches long, and may be used just as it is ruled, or a strip of paper may be ruled with any equal scale divisions, no matter what. The dates of the copies of SCIENTIFIC AMERICAN you requested are March 17, 1888, and August 31, 1889. We can supply all back numbers of the SCIENTIFIC AMERICAN for four years back, and most of the numbers for ten years back, at 8 cents each. We always have all back numbers of the SUPPLEMENT on hand, price 10 cents each.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

MAY 10, 1898,

AND EACH BEARING THAT DATE.

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

Table listing inventions with names and patent numbers, including Acetylene generator, Alarm, Alizarin derivative, Aluminate, Ammonia and waste products, Apparatus for recovering, Taylor & Walker, Awning, Axle repairing apparatus, Bag fastener, Baggage board, Ball mill, Basin fixture, Basket, Bed, Bedstead, Bench clamp and dog automatic, Bending machine, Berth curtain rod fixture, Bicycle attachment, Bicycle brake, Bicycle canopy, Bicycle handle bar, Bicycle locking device, Bicycle seat, Bicycle support, Bit stock, Blackboard, Blacking outfit, Blotter bath, Board, Boiler, Book holder, Boring and shaping machine tool holder, Broom, Bottle and cap, Bottle, non-refillable, Bottle or jar closure, Bottle, self-sealing, Bottle stopper, Bottle stopper, Box, Brake, Brake mechanism, Broom handle, Buckle and purse or bag, combined belt, Button boring machine, Cabinet and duet stool, Cabinet, kitchen, Cable stringer, Can, Can, E. M. Hall, Candle holder, Car and air brake coupling, combined automatic, Car and air brake coupling, combined automatic, Car appearance, passenger, Car coupling, Car coupling, Car fender, Cars, combined track and wheel brake for street, Cars, means for carrying velocipedes in railway, Carbureter spraying device, Carrier, Cartridge, Cash register, Centering machine, Chair and bedstead, Chandelier, Charging buggy, Chimney cowl, Chopper, Cigarette pack, Cigarette box, Cigarette former, Cithern, Clamp, Cleaning, Cloth cutting apparatus, Clothes line support, Coffee pot, Coffee roaster, Coin controlled machines, fraud preventing device for, Coin controlled mechanism, Conduit wiring machine, Cork pulling machine, Corn header, Corn husking machine, Cornet, Cotton chopper, Cotton collecting apparatus, Cotton press, Coupling, Coupling releasing mechanism, Crank arms to crank shafts, means for attaching, Cultivator fertilizer distributor and planter attachment, Curtain pole bracket, Curtain stretcher, Cushion cleaning machine, Cutter, Cutter head, Cycle saddle, Cycle saddle, Dental impression material, Desk or table attachment for furniture, Die for rolled forgings, Die stock, Door guard, Door operating mechanism, Dowel making machine, Draught equalizer, Draw head, Dress shield attachment, Drill, Dropper, Dry house for lumber, Dye, brown sulfur, Dye, brown trisazo, Dye, gray trisazo, Dye, green trisazo, Dyeing apparatus, Dynamo or motor, Electric condenser, Electric conductors, underground conduit for, Electric motor switch, Electrical apparatus for schools, Electrically controlled switch, Electrotherapeutic apparatus, Elevating, transporting and discharging material, apparatus for, Elevator, Elevator control apparatus, Elevator control apparatus, Embroidering machine work feeding mechanism, End gate fastening, Engine, Rotary engine, Envelope, safety, Excavating tool, Explosive engine, Fare receipt slip, Fare register and record, Faucet, beer measuring, Faucet, measuring, Feed water regulator, automatic electric, Fence, T. B. Ferguson, Jr., Fence, T. R. Green, Fence machine, wire, Fence, portable, Fence spacer bar, wire, Fence stay, C. R. Morrow, Fence stay wire lock, Filter, A. N. Sprague, Filter, water, Gage, Garment supporter, Gas burner, Gas device for preventing discharge of, Gas generator, Gas generator, acetylene, Gas meter, prepayment, Gas or oil engine, Gas shutoff, automatic, Gasoline pump, Gate, Gate, Miller, Generator, Steam generator, Glassware, press for making articles of, Gold separator machine, Governor engine, Grain from thrashing machines into wagons or sacks, machine for loading, Grass clipping device, Grass cutting machine, Handle strap, R. Quincey, Hammock chair, swinging, Handle, See Broom handle, Handle bar, T. Vantuyll, Hanger, See Hanger, Hanger for rods or garments, F. Nickerson, Harness hanger, C. S. Carlin, Harrow, J. C. Sturges, Harvester, grain, Harvesting machine, Hat body sizing machine, Hat pin securing, Hat pin securing, Hay cooking machine, Headlight, electric, Heater, Heating by means of liquid hydrocarbons, apparatus for, Heddle bar locking clamp, Hinge, Horseshoe, marsh, Horseshoe nail clencher and hoof trimmer, Hose pipe nozzle and spraying device, combined, Hot air furnace, Hot air furnace, A. R. Blasse, House, See Dry house, Power house, Hydrocarbon burner, Ice handling machinery, Incubator, Index, ledger, Index reinforcing machine, Invalid rest, Ironing board, Jar, Jar and temporary closure therefor, Joint, Keyboard, separable object lesson, Keyboard, separable object lesson, E. A. Fletcher, J. B. Thomas,

Table listing inventions with names and patent numbers, including Car and air brake coupling, combined automatic, Car appearance, passenger, Car coupling, Car coupling, Car fender, Cars, combined track and wheel brake for street, Cars, means for carrying velocipedes in railway, Carbureter spraying device, Carrier, Cartridge, Cash register, Centering machine, Chair and bedstead, Chandelier, Charging buggy, Chimney cowl, Chopper, Cigarette pack, Cigarette box, Cigarette former, Cithern, Clamp, Cleaning, Cloth cutting apparatus, Clothes line support, Coffee pot, Coffee roaster, Coin controlled machines, fraud preventing device for, Coin controlled mechanism, Conduit wiring machine, Cork pulling machine, Corn header, Corn husking machine, Cornet, Cotton chopper, Cotton collecting apparatus, Cotton press, Coupling, Coupling releasing mechanism, Crank arms to crank shafts, means for attaching, Cultivator fertilizer distributor and planter attachment, Curtain pole bracket, Curtain stretcher, Cushion cleaning machine, Cutter, Cutter head, Cycle saddle, Cycle saddle, Dental impression material, Desk or table attachment for furniture, Die for rolled forgings, Die stock, Door guard, Door operating mechanism, Dowel making machine, Draught equalizer, Draw head, Dress shield attachment, Drill, Dropper, Dry house for lumber, Dye, brown sulfur, Dye, brown trisazo, Dye, gray trisazo, Dye, green trisazo, Dyeing apparatus, Dynamo or motor, Electric condenser, Electric conductors, underground conduit for, Electric motor switch, Electrical apparatus for schools, Electrically controlled switch, Electrotherapeutic apparatus, Elevating, transporting and discharging material, apparatus for, Elevator, Elevator control apparatus, Elevator control apparatus, Embroidering machine work feeding mechanism, End gate fastening, Engine, Rotary engine, Envelope, safety, Excavating tool, Explosive engine, Fare receipt slip, Fare register and record, Faucet, beer measuring, Faucet, measuring, Feed water regulator, automatic electric, Fence, T. B. Ferguson, Jr., Fence, T. R. Green, Fence machine, wire, Fence, portable, Fence spacer bar, wire, Fence stay, C. R. Morrow, Fence stay wire lock, Filter, A. N. Sprague, Filter, water, Gage, Garment supporter, Gas burner, Gas device for preventing discharge of, A. S. Gas generator, Gas generator, acetylene, G. Seward, Gas meter, prepayment, C. W. Hinman, Gas or oil engine, F. S. Mead, Gas shutoff, automatic, J. Baird, Gasoline pump, J. A. Gar, Gate, L. Knoldt, Gate, Miller, Generator, Steam generator, Vapor generator, Glassware, press for making articles of, Henry & Ready, Gold separator machine, A. F. Perks, Governor engine, C. M. Giddings, Grain from thrashing machines into wagons or sacks, machine for loading, J. Heyrock, Grass clipping device, J. McCallum, Grass cutting machine, C. W. Harding, Handle strap, R. Quincey, Hammock chair, swinging, A. Stransky, Handle, See Broom handle, Handle bar, T. Vantuyll, Hanger, See Hanger, Hanger for rods or garments, F. Nickerson, Harness hanger, C. S. Carlin, Harrow, J. C. Sturges, Harvester, grain, G. A. Farrall, Harvesting machine, J. C. Moore, Hat body sizing machine, C. E. Keator, Hat pin securing, W. F. Kessinger, Hay cooking machine, W. H. Frazine, Headlight, electric, F. W. Dressel, Heater, Heating by means of liquid hydrocarbons, apparatus for, J. A. Rausband, Heddle bar locking clamp, M. J. Armstrong, Hinge, J. J. Farrar, Horseshoe, marsh, W. H. Borden, Horseshoe nail clencher and hoof trimmer, M. Schmitt, Hose pipe nozzle and spraying device, combined, W. P. Wilson, Hot air furnace, A. R. Blasse, House, See Dry house, Power house, Hydrocarbon burner, J. Reidenbaugh, Ice handling machinery, A. Gifford, Incubator, J. R. Robert, Index, ledger, W. M. Daly, Index reinforcing machine, J. B. Hadaway, Invalid rest, J. Drawe, Ironing board, A. A. Pool, Jar, J. P. Lyon, Jar and temporary closure therefor, J. P. Lyon, Joint, See Rail joint, Keyboard, separable object lesson, E. A. Fletcher, J. B. Thomas,

(Continued on page 334)

Advertisements. ORDINARY RATES. Inside Page, each insertion, - 75 cents a line. Back Page, each insertion, - \$1.00 a line. For some classes of Advertisements, Special and Higher rates are required. The above are charges per agate line—about eight words per line. This notice shows the width of the line and is set in agate type. Engravings may be had at advertisements at the same rate per agate line, by measurement, as the letter press. Advertisements must be received at Publication Office as early as Thursday morning to appear in the following week's issue.

WOOD OF METAL WORKERS without steam power can save time and money by using our Foot and Hand Power Machinery. SEND FOR CATALOGUE—A—Wood-working Machinery. B—Lathes, etc. SENECA FALLS MFG. COMPANY, 695 Water St., Seneca Falls, N. Y.

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

THOROUGH INSTRUCTION BY MAIL. Mechanical, Electrical, Steam, Civil, and Sanitary ENGINEERING. Mathematics, Mechanical Drawing, and Machine Design. SPECIALLY PREPARED TEXT BOOKS FREE. Tuition payable Cash or \$2.00 per month. Write for free S. A. Circular. THE UNITED CORRESPONDENCE SCHOOLS, F. W. Ewald, Gen. Mgr. 154-158 Fifth Ave., N. Y.

THE HALL BRASS PIPE WRENCH. A PERFECT TOOL WITH FRICTION GRIP. Bungs for all sizes and shapes. Highly polished pipes made up without scar or injury. For Circulars and Prices. WALWORTH MFG. CO., 16 Oliver St., BOSTON, MASS.

ARMSTRONG'S PIPE THREADING AND CUTTING-OFF MACHINES. Both Hand and Power. Sizes 1 to 6 inches. Water, Gas, and Steam Fitters' Tools. Hinged Pipe Vises, Pipe Cutters. Stocks and Dies universally acknowledged to be THE BEST. Send for catalog. THE ARMSTRONG MFG. CO. Bridgeport, Conn.

BARNES' UPRIGHT DRILLS. Complete line, ranging from Light Friction Disk Drill to 42" Back Geared Feed. Send for New Catalogue. W. F. & JOHN BARNES CO. 1999 Ruby Street, ROCKFORD, ILL.

HIGH GRADE WORKING MACHINERY. Single Machines or Complete Equipments for Any Class of Work. Your Correspondence is Solicited. Illustrated Matter and Prices on application. J. A. FAY & CO. 10-30 John St., CINCINNATI, OHIO

SUB-PRESS PUNCHES AND DIE. We make to order drawings or models blanking, shaving and swaging dies, either simple or compound, for work requiring accuracy and finish. Sub-Press Dies for the parts of watches, clocks, cyclometers, and other small mechanisms a specialty. We carry in stock different sizes of Sub-Press Bands and Stands. Send for Descriptive Circular. THE PRATT & WHITNEY CO. Hartford, Conn., U. S. A.

Skinner Combination Lathe Chuck. Strong and true. Best reversible jaws—easily reversed. Made of steel, case hardened. No strain on the screws. Upper section of jaw may be left off and chuck used for cutting stock. Greater capacity than any other chuck. Can be fitted with interchangeable jaws. SKINNER CHUCK CO. Church St., New Britain, Conn.

YOUR FOOT DOES IT ALL! Every mechanic who has tried it is delighted with the Rivett Bicycle Foot Power which is invaluable to those who do not have steam or other power at command. Polished cast iron table, with true, smooth surface. Heavy wheel with regular motion and great power. Weight of all 350 lbs. Send for 1898 Catalogue. FANEUIL WATCH TOOL CO., Boston, Mass., U. S. A.

On Receipt of Ten Cents in Stamps (practically 25% of retail price) we will send you one of our 1-2 INCH AUGER BITS. A fine cutting tool, perfect clearance, especially good in hard wood and for end boring. Send for Cir. S. A., free. THE FORD BIT CO., HOLYOKE, MASS.

THE HARRINGTON & KING PERFORATING CO. PERFORATED ZINC FOR CLEANING OF GRAIN & ALL PURPOSES. ANY SIZE & SHAPE SHEET-METALS OF HOLE. 225 NORTH-UNION ST. CHICAGO, ILL. U.S.A.