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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 This is for our information and not for publication.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.

(7738) A. M. D. asks: 1. In the electrolysis of water about what per cent of the energy of the current is lost in producing heat in the solution? A. The heat developed in any circuit by the passage of an electric current through that circuit is expressed by Joule's law Heat=0.24 C^2Rt.

in which C is the number of amperes, R is the number of ohms, and t is the time in seconds. The heat is found in calories. This equation is derived from the fact proved by experiment that one ampere flowing through a conductor having a resistance of one ohm will develop in that conductor 0.24 calories for each second it flows. It makes no difference whether the current is decomposing water or doing any other work. The heat produced is the same. This is the lost energy of an electric current. 2. How does the heat developed by burning the oxygen and hydrogen combined, compare with the original energy of the current? A. The doctrine of the conservation of energy requires that the heat produced by recombining the oxygen and hydrogen into water shall exactly equal the energy in any other form which may be required to decompose the same quantity of water into its constituent oxygen and hydrogen again. This heat has no connection with the heat of the first query.

(7739) W. P. asks: I have a 4-ohm telegraph instrument. What number of wire (by A. W. G.) and how much must be used to wind it for 20 ohms? To change your 4 ohm sounder to make it have 20 ohms, you can unwind the wire on it at present and get 4 times as much of the same size to be put on together with that which was on the sounder before. If you know the number of the wire now on the sounder you can find from a wire table the length needed to make 16 ohms. This is the quantity you need to add to the sounder.

(7740) A. B. T. asks how the slit is cut in the ribs of a steel pen. A. The slit in steel pens is cut in a shear press with very sharp cutters.

(7741) A. B. S. asks: 1. Will small hand-power dynamo, as described in "Experimental Science," furnish power enough for spark, to ignite gas in gas engine? A. The hand-power dynamo will give a spark which will ignite gas. It will probably serve your purpose if driven at a high speed. We have recently advertised a dynamo especially designed for this work. 2. What is a jump spark? A. A jump spark is a spark produced by the breaking of an electric circuit, and which jumps between two metallic points. 3. Is it necessary to have iron jar for caustic potash cell as described in "Experimental Science"? A. The iron jar is one of the electrodes in the potash cell. If you use a glass cell you will require an iron plate in the liquid as an electrode. Since an old iron pot will answer every purpose it is the cheapest method of putting up the battery.

(7742) S. C. asks: 1. How is electricity transmitted through the air as is thus done by the wireless telegraphy? A. The waves produced by an impulse of electricity through a wire, fly off from the wire in all di-

rections. If the wires are properly arranged the waves may be perceived by a properly constructed apparatus at a long distance from their source. 2. How is the record of the gramophone made? A. The record of the gramophone is at first traced upon zinc, and afterwards etched into the zinc. This is transferred to hard rubber disks such as are used for the instrument. From the zinc disks a large number of impressions may be taken. 3. Of what are the diaphragms of talking machines made? A. The diaphragms of talking machines are made of thin glass, celluloid or iron.

(7743) H. W. C. writes: I have a small range boiler, galvanized iron, which I use for oxygen tank for lantern use. Now the tank is badly corroded inside and I wish to know what kind of paint or varnish would be suitable to use that the gas or any dampness carried over from wash bottle, would not affect. A. If your oxygen tank is badly corroded, you should not use it, since it is in danger of bursting under pressure. Asphalt varnish is the best substance to use to coat the inside of such a tank as a preventative of rust but we do not think it would be safe to use paint or varnish of any kind on the inner surface of the tank. The better way is to dry the oxygen before it enters the tank, since oxygen, in presence of water will rust iron or steel very rapidly. If the gas were passed through calcium chloride after it leaves the wash bottle it would enter the tank dry.

TO INVENTORS

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending OCTOBER 17, 1899.

AND EACH BEARING THAT DATE.

(See note at end of list about copies of these patents.)

Table listing inventions with names and dates. Includes: Alarm, Amalgamating apparatus, Ammunition carrier, Antiseptic device, Ax or similar tool, Axle and axle box, Axle box, Backstay turning device, Bag tying device, Ball making machine, Barrel, Bearing ball, Belts, Benzoin and homologues, Bicycle, Bicycle driving gear, Bicycle gearing, Bicycle grip, Bicycle pump, Bicycle saddle, Bicycle spring frame, Billiard and dining table convertible, Blast furnace, Bleaching, Boiler, Boiler alarm, Book, Book manufacturing, Book pass, Boot or shoe top supporter, Boulder depressor, Box, Brake, Breathing tube, Broom holder, Brush head, Buckle, Buckle wire, Bundle discharging mechanism, Burial casket lowering device, Burner, Button, Caliper, Calipers, Camera, Camera shutter, Can opener, Car body bolster, Car coupling, Car door, Car dumping, Carbureting apparatus, Carpet fastener, Carrying apparatus, Cartridge shells, Case, Cash carrier, Casting aluminum alloys, Casting chilled rolls, Chair, Chopper, Chopping knife, Chuck, Chuck automatic, Churn, Cigarette machine, Cleaner, Clevis, Clutch, Coals, Cock, Coffin, Cold holder, Column, Column band, Cudgel, Connection, Converter, Copy holder, Corn husker, Cotton chopper, Coupling, Crushing and grinding mill, Cultivator, Current meter, Cuspidor, Cutter, Dental tool guard, Derrick and excavator, Derrick foot block, Digger, Dish washing machine, Display apparatus, Display device, Digestion of wood, Dock construction, Door check.

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Table listing various inventions and their patent numbers. Includes: Dredge, Dressing machinery, Dredging machinery, Drier, Dry mill, Dye, Educational appliance, Egg case, Elastic or resilient wheel, Electric heater, Electric meter, Electric motor, Electric motor frame, Electric motors, Electrically illuminated devices, Electrician's tool, Elevator, Elevator safety appliance, End gate, End gate, wagon, Engine, Engine vaporizer, Engine stopping system, Envelop fastener, Envelop machine, Excavator, Excavator machine, Expansion engine, Fasteners for gloves, Fastening device, Faucet measuring, Faucet register, Feed box, Feed trough, Feed water apparatus, Feed water heater, Feed water regulator, File, invoice, Cross, Filter, Filter apparatus, Filter, water, C. Salzberger, Firearm, recoil operated, Fire escape, Fire escape and scaffold, Floor foot shield, Fluids or gases under pressure, Fodder cutting machine, Forge, means or heating, Furnace, Furnace for annealing, Furnace reversing valve, Gate, Gate, E. E. Hanken, Gear casing, Gears, Generator, Gin saw, Glass cutting machine, Glass manufacturing apparatus, Glove, Gold or silver ores, Governing mechanism, Grain cleaner, Grain header, Grapple, Grass cutter, Grate, Guard rail, Gun telescope attachment, Hammock and elevator, Handkerchief holder, Hanger device, Harness loop, Harrow seeding attachment, Harrow tooth fastening, Harvester, Hat rack, Heater, Heating system, Heel shoe, Hoisting machine, Horseshoe, Hub, Hydrocarbon oil burning apparatus, Igniting device, Incandescent bodies, Indicator, Insulator, Insulated handle, Jack, Jar closer or opener, Joint, Journal box, Knife, Label affixing machine, Lamp, electric incandescent, Lamp, street, Land roller, Last for boots or shoes, Lasting machine, Lathe for turning balls, Letter, Lifting jack, Lifting jack, Lifting jack, Lifting jack, Liquid meter, Lithographic press, Lubricator, Magneto-electric machine, Marble, manufacture of artificial, Marking sheep, Match box machine, Measuring and cutting goods, Measuring instrument, Measuring instrument, Meter, Mill, Mill, Mining machine, Motor, Motor, Musical instrument, Musical instruments, Nailing machine, Necktie retainer, Nipple boiler, Nipple boiler, Optical apparatus, Oven door, Paper bag machine, Paper making machine, Paper pulp straining apparatus, Paring and coring machine, Pavement, cement concrete, Pea rake, Phonograph, Photogramoscope or photochromoscope camera, Pliers or dams, Pin, Piston lubricator.

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