

MENT can I find this information in? A. SUPPLEMENT, No. 600, price 10 cents, will furnish you plans and instructions for an eight light 50 volt dynamo. 3. What is a good soldering fluid for soldering brass? A. There are several non-corrosive soldering pastes on the market. These are far better than the soldering fluid made of muriatic acid and zinc. Address dealers in electrical supplies.

(7618) H. J. D. asks: Is it possible for a man to know the direction in which he is going if he were enclosed in a box with nothing except a compass? A. Most certainly, unless the box were of iron, with a thickness of 1/4 to 1/2 an inch. Is not the needle of an ordinary compass enclosed in a box made of brass and glass? Is not a compass, when in a house, enclosed in a box of wood or brick or stone? It will point toward the north indoors just as well as in the open air.

(7619) W. L. W. asks: What metals expand and contract most from the effects of heat and cold, between the degrees of freezing and 100° above zero, and of those how much will they expand and contract? A. The figures given below are called coefficients of expansion. They are the amounts by which a piece of the metal 1 inch long is expanded in length on heating it 1 degree Fah. Brass, 0.0000104 inch; aluminum, 0.0000136 inch; lead, 0.0000163 inch; tin, 0.000124 inch; zinc, 0.0000162 inch. From these numbers you can easily calculate how much a piece of any length will expand on heating it from freezing to 100 degrees. To find the length of a bar at any required temperature, measure its length and temperature. Then find the number of degrees it is to be heated or cooled. Multiply the coefficient of expansion by the number of degrees the bar is to be heated, and this by the length of the bar. The product is the expansion. To this add the original length. If the bar is to be cooled, subtract the expansion instead of adding it.

(7620) G. F. C. asks how to magnetize a 6 inch compass needle by electricity. Please give size of wire, number of turns, length of coil, size of core, and number of cells of 5 by 7 gravity battery (if that kind will do) to magnetize to saturation. A. Make a coil of wire of about No. 16 and of such a size that the needle to be magnetized shall be wholly within it. Connect the coil to the battery and let the current flow through the coil for a little while. No core is wanted in the coil. The needle is the core. Size of battery not important. One cell will do the work, more will do it quicker. You can test the needle by counting the number of swings it will make in a minute. Repeat the magnetizing till further magnetizing does not make it swing any faster.

(7621) R. J. P. asks how white ink is made. A. 1. Triturate together 1 part of honey and 2 parts dry ammonia alum. Dry thoroughly, and calcine in a shallow dish over the fire to whiteness. Cool, wash, and rub up with enough gum water to use. 2. Fine French zinc white, or white lead, rubbed up with gum water to the proper consistency. 3. Mix pure freshly precipitated barium sulphate, or flake white, with water containing enough gum arabic to prevent the immediate settling of the substance. Starch or magnesium carbonate may be used in a similar way. They must be reduced to impalpable powders. 4. White Ink for Blue Paper.—Use oxalic acid and water. This bleaches the paper, leaving white lines.

(7622) A. O. writes: I would like to ask you how long the patents have been running on revolving or rocking grates, such as used in locomotive boilers, heaters, etc.? A. The first patent on such grates was granted to Eliphalet Nott, the former celebrated president of Union College, Schenectady, N. Y. It rocked on a horizontal axis and was made in different shapes. It was used in his stoves, which were widely known. The Nott patents describe the grates as applicable to "furnaces of every sort." A grate adapted to revolve horizontally and stated to be applicable to steam engine boilers was patented in England in 1819.

(7623) J. A. S. asks: 1. Is man originally a natural meat eater, or only by habit? A. The possession of teeth adapted for eating both vegetable and animal food is understood to indicate man's original adaptiveness to eat both. 2. If you heat one end of a piece of fine wire one hundred feet long, will any heat or molecular motion be transmitted to the other end? A. That depends on the kind of wire and the temperature of the surrounding space. It is not, however, probable that so long a wire could be heated perceptibly 100 feet from the source of heat. 3. What is the principal use of the condenser in connection with the steam engine? A. The condenser reduces the pressure by nearly one atmosphere on one side of the piston of a steam engine. 4. If the sound of several different instruments, playing at the same time on the same note (C for instance), be transmitted to the record of graphophone, will there be a separate impression for each instrument or one for the combined sound? A. The combined or resultant vibration of the diaphragm is recorded by the stylus of a phonograph and all similar instruments.

(7624) C. B. asks if a common magnifying glass can be substituted for a camera lens. If there is any particular kind or size, I wish you would mention them. If they cannot be used, please state why not. A. A common magnifying glass can be used for a camera lens in taking landscapes by covering all of it but a small circle in the middle. If your lens is 2 inches in diameter, cover all but 1/4 to 3/8 inch of the middle. If a large opening is used the center of the picture and its edges will not be in focus at the same time. Look up "Spherical Aberration" in any text book of physics.

(7625) E. H. H. asks: How are the high temperatures produced and measured as produced in some chemical laboratories? A. The highest temperatures produced on the earth are produced by the electrical furnace. The apparatus for the measurement of the temperatures is based upon the expansion of gases, upon the specific heat of the substances, and upon the laws of thermo-electric currents. A thermo-electric couple composed of platinum and palladium will work up to the melting point of palladium, which is 1,700° C., and one made of platinum and an alloy of platinum and rhodium will measure temperatures up to 1,200° C. with an error of less than 10°.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

MARCH 14, 1899, AND EACH BEARING THAT DATE. (See note at end of list about copies of these patents.)

Table listing inventions with patent numbers, including: Abdominal supporter, Acid to outflowing water, Aerating water in bottles, Air brake mechanism, Alarm, Amalgamator, Annunciator indicator, Anode, Antitrust preparation, Armor plate, Automatic gate, Badge, Balloon, Bath bucket, Battery elements, Bearing ball, Bed bottom, Bell striker, Belt clasp, Belt fastener, Bicycle mud guard, Bicycle brake, Bicycle driving gear, Bicycle gearing, Bicycle holder, Bicycle pedal, Bicycle saddle, Blacking machine, Blower, Blowing engine, Boiler, Boiler hanger, Boring machine, Bottle, Bottle filling machine, Bowl, Box for cigarettes, Box or case, Box or case, Bread of variable widths, Brake beam, Burial casket, Butter extractor, Button drilling machine, Cabinet, Camera, Car attachment, Car coupling, Car coupling, Car coupling, Car door, Car dump, Car loading apparatus, Car, railway, Cars, shoveling board, Carding machine, Carpet fastener, Carriage curtain fastener, Carriage wrench, Cartridge belt, Case, Casket handler, Chain drive, Chain links, Chair, Chandelier, Change maker, Chromates, Cigar tip cutter, Cigarettes, Cigarettes machine, Circuit breaker, Cithern, Clamp, Clasp, Clay for manufacturing pottery, Clevis, Cloth finishing press, Cloth margins, Clothes drier, Clothes line supporter, Clutch, Coatings, Cock valve, Coin delivering device, Coin delivering device, Compass head, Cooler, Cork puller, Corset busk, Coupling, Coupling pin, Cracker machine, Crate, Cream separator, Crushing mills, Current motor, Current motor, Curtain ring, Curtains, Cutter, Cycle frames, Cylindrical blanks, Dental engine, Digger, Dishes or trays, Display stand, Display stand, Distilling apparatus, Door check, Door hanger, Door board, Drains, Drawer, Dress shield holder, Drier, Drill, Driving mechanism, Egg case, Electric meter, Electric motor, Electric motor, Electric motor, Electric switch, Electric wires, Engine, Engine, Engine, Engine, Engine, Envelope, Explosive engine, Fare receiver, Feed roller, Feed water heater, Fence post, Fence wire, Fire alarm, Firearms, Fire escape, Fire extinguisher, Fish hook, Fishing tool, Floor, Floor, Flushing mechanism, Foot of leg rest, Frequency changer, Fruit gatherer, Fruit grader, Fruit or vegetable cutter, Fuel, Furnace, Furnace charging machine, Furnace smoke consuming device, Garment hanger, Garment supporter, Gas burner, Gas compressing machine, Gas engine, Gas generator, Gas generator, Gas meter, Gas or vapor engine, Gas purifying apparatus, Gas tank, Gate, Generator, Governor device, Grate, Grates, Grinding machine, Grinding machine, Gun, Gun carriage, Gun sight screen, Gun or ordinance gear, Hanger, Harrow, Hat, Hay rake, Head and signal light, Heat regulating device, Heater, Heater, Hide or skin shaving machine, Hinge, Hinge spring, Hook, Hog trap, Hook, Hook and eye, Hook and eye, Hook and eye, Horseshoe, Hose coupling, Ice cream cabinet, Ice cream delivery package, Ice trays, Indicator, Induction motor, Inking pad, Insect trap, Insole, Inter sole, Iron, Jack, L. O. Henggi.

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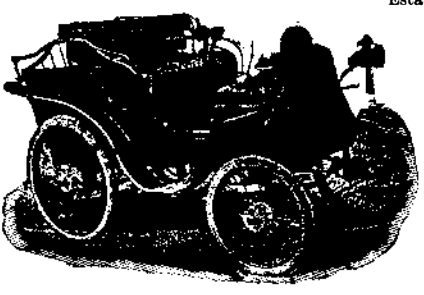
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Pad, see Inking pad.....	
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Plows, rotary subsoil attachment, T. Hawk.....	620,919
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Polishing wheel, F. P. Pfeighar.....	621,131
Pool table, Walsh & Shepherd.....	621,187
Portfolio, letter file, etc., A. Krahn.....	621,256
Post. See Post.....	
Potato digger, C. C. Dupre.....	621,232
Press. See Cloth finishing press.....	
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Rubber or other gums, manufacture of, E. Gardner.....	621,060
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Sad iron, J. V. Eves et al.....	621,235
Sad iron, gas, H. Geffroyer.....	621,062
Sad iron, self heating, A. E. Cordray.....	621,139
Safe bolt work, M. Myler.....	621,122
Safety hook, A. J. Curtis.....	621,295
Sash worker, window, C. H. Strauss.....	621,174
Saw table, D. H. Lentz.....	621,106
Scale, A. De Vilbiss, Jr.....	621,297
Seat for sewing machine, J. Stewart, Jr.....	621,049
Seat back, W. E. Ellis, J. Stewart, Jr.....	621,096
Self acting lubricator, S. H. A. Jones.....	621,170
Separator. See Cream separator.....	
Sewing machine, J. Stewart, Jr.....	621,170
Sewing machine feller, G. H. W. Curtis.....	621,039
Sewing machine lap seam feller, G. H. W. Curtis.....	621,038
Sewing machine presser foot, A. Rontke.....	621,145 to 621,147
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Sole shanking machine, O. Faquette.....	621,129
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Stacker, straw, G. Fisher.....	621,237
Stalk cutter, J. A. Dins.....	620,929
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Stampmill, annular, F. L. Preston.....	620,962
Stand. See Display stand.....	
Stand or support, H. T. Loomis.....	620,943
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(Continued on page 191)

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