

Business and Personal.

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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 This is for our information and not for publication.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.

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.

(4713) C. C. says: Am contemplating a cistern on a hill half a mile distant from house, to have 2 1/2 inch pipe to house. Amount of fall 73 feet, object to furnish water for house use and fire protection. What will be probable height stream can be thrown through 1 inch hose with 1/4 inch nozzle? Can I throw same size stream, using 1 inch pipe for main? What will be the pressure at house? A. You can throw a 1/4 inch stream 38 feet high from a 2 1/2 inch main with stated head. A 1 inch main would be of no value as a fire protection, about 10 feet in height only. For household purposes the 1 inch pipe would flow in all stories, but the friction will give no force to a jet of any value, but will deliver about 7 gallons per minute with an open pipe. When the pipe in either case is closed, the pressure will be 3 1/4 pounds per square inch.

(4714) A. J. V. asks: Is it possible to attain a greater speed with an ice yacht than the prevailing wind? If so, under what circumstances, and what is the best record? A. A first-class ice boat, the ice in fine condition, the wind from the right quarter, will sail much faster than the wind. A wind of twenty miles velocity per hour will drive the boat fifty or sixty miles per hour. The best record we call to mind for an ice boat is 70 miles per hour.

(4715) Gas Producer says: With steam jet discharging fifteen cubic feet of steam, at pressure of 25 pounds per square inch per hour, what should be dimensions and form of a cone to induce blast of air under grades of gas producer, or mixture of air and steam of the proportions of twenty of air to one of steam by weight? With temperature of air at 60° Fah., what should be temperature of this mixed blast, and what pressure, in inches of water, should it develop? A. Steam issues from a finely tapered nozzle at 800 feet per second at 25 pounds pressure and expands to 700 volumes of mixed steam and air from the area of the nozzle. For the quantity of steam 1 1/2 cubic feet per hour, you will need a taper nozzle 1/4 inch diameter, and for its best work and for 300 cubic feet of air per hour, requires a 6 inch tube 30 inches long, delivering the mixed air and steam at a velocity of 6 feet per second and a water pressure of 1/2 of an inch.

(4716) A. J. B. asks (1) the best way to temper horse shoes and bars for permanent magnets,

and if with water to what color? A. Temper to a straw color. 2. Is there any rule (and if so, what) to determine the number of ampere turns necessary to produce a given number of magnetic lines of force in a core of laminated Russian iron or cast iron? A. The rules are rather long to be given here, and should be illustrated by examples. You will find them treated in Sloane's "Arithmetic of Electricity," \$1, and also in Thomson's "Electro-Magnet and Electro-Magnetic Mechanism," \$6. Either book we can supply by mail. 3. Also the best way of magnetizing permanent steel magnets? A. Simply hold one end against a strong dynamo pole. There are various other ways. You may surround it with a coil of insulated wire or of wire whose convolutions do not touch, and pass a strong current through the coil.

(4717) L. S. S. says: If a train goes 5,000 feet per minute, and another train is behind it, following it at the same rate of speed, they are 50 yards apart, the last train has a cannon; when fired will travel the same speed as the train (the cannon ball, of course); will that cannon ball get away from the last train, or in other words, if a man stood on the rear end of first train, could the cannon ball catch them if aimed at him? A. Yes.

(4718) J. L. P. writes: I have a ring armature about 2 1/2 inches in diameter by 2 inches across the face. It is wound with 12 coils of No. 19 magnet wire, each containing about 11 feet or a little more, about 135 feet in all. Do you think it could be used as an armature for a small dynamo? I have a set of field castings to fit, and want to use it for something. A. Your armature will answer for a small dynamo or motor. You cannot, however, expect very much from it. Consult SUPPLEMENT, No. 641, for information as to the construction of a small motor.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted February 28, 1893.

AND EACH BEARING THAT DATE.

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

Table listing inventions with names and patent numbers. Includes items like Alarm, Amalgamating ores, Amalgamator, Annular electrical, Armature for dynamo-electric machines, Axle bar and blank, channeled, Axle box frame for car trucks, Axle lubricator, Axle, vehicle, J. D. Wilson, Battery jar, Bed, folding, Bed, sofa, Bed, sofa, J. Lewin, Bell, alarm, A. P. Merrill, Bells, device for operating door, H. C. Sutton, Bolt holder, C. Baumgarten, Bolt shifter, Schraubstiftler, J. & Schilling, Bicycle gun clip, J. S. Copeland, Bit, See Bridge bit, Bituminous rock reducing apparatus, E. R. Thomson, Block, See Hoisting block, Pulley block, Tackle block, Boiler, See Steam boiler, Water tube boiler, Boiler, H. A. R. Dietrich, Bottle corking machine compressor, E. Krmold, Bottle opening implement, G. M. Casey, Box, See Letter box, Match box, Refrigerator box, Bracket, See Insulator bracket, Braiding machine, J. W. Schloss, Brake, See Car brake, Wagon brake, Brake beam, C. K. Pickles, Brick machine cut-off, J. Creager, Brick or tile cutter, Cornelius & Collins, Brick protector, untraced, A. C. Contant, Bridge gate, C. Contant, Bridle bit, J. E. Driscoll, Brush, C. W. Parks, Brush blocks or backs, machine for shaping, J. Cook, Brush making machine handle, J. Cook, Burglar alarm, electric, C. F. Starr, Burner, See Fuel burner, Hydrocarbon burner, Butter flrink, F. S. Osgood, Button, C. T. McClintock, Button blocks, machine for making, G. W. Lieb, Button cabinet, A. R. Ingalsbe, Buttonhole cutter, A. M. Wright, Buttoning machine, J. W. Lowrie, Button holes, forming, G. Havell, Button setting machine, A. W. Ham, Cable support, G. P. Wern, Cake cutter, W. P. McAlister, Camera, See Photographic camera, Can winders, J. H. Dean, Car brake electric, W. C. Fletcher, Car coupling, T. L. McKeen, Car fender, J. Nagels, Car wheel, J. W. Cloud, Car windows, cinder, dust, and smoke excluder for, J. C. Fry, Cars, apparatus for electrically propelled, C. J. Knicker, Carbons, production of artificial crystalline, E. G. Acheson, Card mounting machine, fillet, J. S. Dronfield, Carding cylinders, device for holding and stretching card clothing while being attached to, H. C. Kitching, Carding engines, actuating mechanism for doffer-combs of, W. P. Cannling, Carding engines, actuating mechanism for doffer-combs of, C. L. Hildreth, Carpet stretcher and tacker, J. A. Stephens, Carriage, J. Spofford, Jr., Carriage, child's, G. B. Best, Carriage seat, Morrill & Wells, Carrier attachment, E. W. Ross, Case, See Thread case, Watch case, Cash register and indicator, J. B. Anfuldish, Cash register and indicator, W. F. Z. Desant, Caster, furniture, C. A. Fellows, Casting apparatus, stereotypic, P. J. Wendell, Centrifugal separator, P. M. & D. T. Sharples (r), Chain and the manufacture thereof, A. Shedlock, Chair base, E. E. Koken, Chair holding apparatus, A. N. Southwick, Chuck and drill, H. Meister, Churn, H. C. Atkinson, Churn power, T. J. Price, Cigar, L. M. Harris, Cigar bunching machine, H. Schmidt et al., Clamp, See Sucker rod clamp, Clip, See Bicycle gun clip, Whiffletree clip, Clothes drier, J. McKinnon (r), Clothes line holding and operating device, J. J. Kinman, Clutch, J. Fraser, Coin-actuated bore detecting apparatus for, G. A. Tabersmidt, Coin-controlled apparatus, M. Slough, Coke oven, G. Hoffmann, Color disk rotating machine, M. Bradley, Column, metallic, W. C. Gibson, Cord covering machine, T. Adams, Cord for cables, etc., E. Maynard, Cord or twine shearing mechanism, E. T. & E. H. Marble, Corn thinner, C. Garnett, Coupling, See Car coupling, Fifth wheel coupling, Thill coupling, Cryptographic instrument, B. Harte, Cylindrical, E. Davis, Cylindrical, E. Miller, Currents, etc., machine for cleaning, W. Vickers,

Table listing inventions with names and patent numbers. Includes items like Curtain fixture, J. L. Baker, Current engine, C. E. Rhone, Current engine, C. E. Rhone, Cutter, See Brick or tile cutter, Buttonhole cutter, Cake cutter, Pipe cutter, Stock cutter, Washer cutter, Cycle wheel shoe, H. Gregory, Dental apparatus, A. S. Richmond, Disinfecting apparatus, F. S. Coon, Disinfecting device, J. Pickering, Door, sliding, J. S. McAnaney, Doors, adjustable track for sliding, E. Y. Moore, Dovetail, pattern for moulding, E. Kuhn, Dredging spuds, device for locking and operating, F. H. & G. W. King, Dress waist fastening attachment, D. E. Wasson, Drier, See Clothes drier, Drilling and turning, bow for use in, I. Read, Drilling machine, Worcester & Morgan, Dust pan, D. K. Barnhart, Electric lighting system, R. W. Rollins, Electric motor, F. H. Bers, Electric motors, switch for operating shunt wound, F. H. Berry, Electricity, coin-controlled machine for administering, W. R. Pope, Enamelling furnace, G. E. Kreschner, Engines, traction, Traction engine, Eyeglasses, De Celles & Wells, Fan, J. H. Irving, Fan, ceiling, J. H. Beers, Fan, rotary fly, M. V. Fitz Water, Farm gate, J. M. Richardson, Feedwater heater, A. Miller, Fence folding, W. Purling, Fence wire strands, implement for tightening, J. Whittaker, Fender, See Car fender, Fifth wheel coupling, vehicle, J. J. Fetzer, Filt, pressure water, L. W. Modingo, Filter, saw teeth, F. H. Lubbe, Firearm, magazine, J. M. & M. S. Browning, Fuse, drain, or pipe cleaning device, W. Dundon, Folding mechanism, L. C. Crowell, Fuel burner, fluid, N. J. Skages, Furnace, See Annealing furnace, Enamelling furnace, J. B. Archer, Furnace for roasting, calcining, and oxidizing metals and their compounds, H. Frasch, Furnaces, air heating device for, R. Potter, Fuse device, thermostatic, A. Wurts, Gauge line holder, A. S. Snyder, Gaiters, F. B. De Long, Garment shaper, J. B. Leavitt, Garment supporter, A. W. 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Sturges, Hooks and eyes, eye for, J. M. St. wart, Horse hoof guard, W. Brown, Horseshoe fastening, nailless, D. L. Mayow, Horseshoe, nailless, C. W. Crannell, Horseshoe, rope tread, T. Doyle, Hot water heater, R. Frank, Hot water heater, H. T. Newell, Hotel alarm, electric, J. McMurray, Jr., Hub protector, E. F. Ryder, Hydrocarbon burner, H. N. Hawes, Indicator, See Speed indicator, Insulator bracket, W. N. Eichberg, Jar fastener, C. C. Blits, Jar, See Battery jar, Joint, See Swing joint, Journal bearings, composition for, J. T. Richards, Knife, J. E. Pocket knife, Knife, J. E. Pocket knife, Knitting machine, W. Diebel, Label, H. J. Tibbals, Lamp, electric arc, W. P. Wiemann, Lamp lighter, R. H. Jolly, Lamps, wick carrier for central draught, W. A. Fenfield, Latch, A. Gies, Leach sprinker, C. F. Wells, Leg attachment, artificial, R. E. McDuffie, Letter box, house door, A. Smith, Letter box, house door, A. H. Stewart, Levee and dam structure, G. P. 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W. French, Pipe support, G. Taylor, Pipe wrench, E. B. Kittenhouse, Planer, See Joint planer, Planer, scroll, J. W. Tuggie, Plants, contrivance for training growing hop, J. A. Partridge, Plotter, D. C. Hudson, Plow, C. Hartzell, Plow, combination heel sweep, J. R. Dean, Pocket knife, E. B. Carter, Pocket knife, C. B. Balston, Polishing and grinding machine, H. Gelsenhoner, Power, See Chain power, Press, See Hay press, Printing machine using mechanism, L. C. Crook, Printing press, registering device, H. A. Wood, Pulley block, differential, E. Y. Moore,

DESIGNS.

Table listing designs with names and patent numbers. Includes items like Badge, L. Oudelsly, Curtain pole, A. B. Harsha, Easel, A. J. Parlin, Gimp, H. Hook, Medal, C. F. Naegle, Medal, J. A. Yount, Music rack, G. Porteous, Pattern for card electric, C. H. Stratton, Spoon, L. Burker, Spoon, C. Osborne, Square, dressmaker's, J. E. Flesher, Antiprismatic anodyne in powdered form, J. W. Newburne, Beds, folding, Standard Folding Bed Company,