



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 This is for our information and not for publication.

(9157) R. A. N. says: 1. What apparatus is necessary to install telephone apparatus on a telegraph line? We wish to use only transmitters and receivers and such other as is necessary, using the telegraph battery as battery for the telephone.

2. There is another telephone line on our poles; why is it that we can hear them talking while the lines are 18 inches apart? A. What you hear from one line to another is called "cross talk."

3. When the lines get crossed we can hear them talk by putting an ear close to the sounder. Why is it? A. The sounder of a telegraph has long been known to be able to receive a telephone message. It is because the sounder is affected by the waves and vibrates just as the diaphragm of the receiver does.

4. I have read that the electricity flows around the surface of a wire and not through it. A. Electricity of very high voltage, as that of the lightning, does not penetrate a wire, but flows on its surface. This is not the case with the current from a battery. It penetrates the metal and goes through the wire.

5. Will a rusty wire offer more resistance to its passage than a galvanized wire? A. From the answer to the last question you will see that if a wire is rusty upon its surface only, it can conduct electricity as well as if bright; but if the wire is so much rusted that its body is reduced by the rust, it is equivalent to a wire of the size of its unrusted portion, and cannot conduct electricity as well as one unrusted, of its former full size.

(9158) M. E. C. asks: I wish to put a telephone line from our house to one of our greenhouses a distance of about 320 feet. Will you please tell me the best way of running the wires underground? Are the lead-in wires durable enough to be buried directly in the ground or should they be run through pipes? A. The lead-in cables can be run by laying them directly in the earth. They are very durable unless a break occurs in the sheath.

To prevent injury from this cause, it is better to use the cable with a core saturated with an insulating substance which repels moisture. These can be obtained with one or more pairs of conductors.

(9159) A. H. F. says: I would like for you to answer these inquiries either by letter or through your Notes and Queries column. I would like to know at what speed a trolley can be run constantly or can it be run at the rate of 60 or 70 miles an hour, with stops at about 35 or 45 miles, without injury to the wires or trolley contacts, such as pulleys. I think it is impossible to run a trolley and keep proper contact at the rate as stated above. Can you tell me what line, and where the highest speed is run and what distance runs are made without stops of about 35 or 45 miles? A. Trolley cars can be run constantly at any speed which they can attain at any time, if the roadway is safe and there is no break-down. There is nothing to prevent this in the trolley wheel or shoe of the contact with the third rail. Forty to fifty miles per hour has often been made for a short time, but cannot be maintained on any road because of stops and grade crossings with highways. An experimental track is in existence in Germany upon which over 100 miles an hour has been made. If there was any need of such a road electrical engineers would undertake to build and operate an express road with 60 miles per hour and stops at any interval desired. But there is no one to put up the capital for such a road, since it is not needed at present.

(9160) J. E. J. says: There are several gasoline engines in this town and the spark or battery gives us more trouble than a little. Will you please answer in Notes and Queries what is the best battery, liquid or dry, for a small (1 1/2 horse power) engine. Have you a SUPPLEMENT that gives full information? A. Dry cells are usually employed for sparking gasoline engines. See Hiscox's "Gas Engines" for a full treatment of the matter; price \$2.50 by mail.

NEW BOOKS, ETC. CHEMISCH-TECHNISCHES REZEPTBUCH FUER DIE GESAMTE METALLINDUSTRIE. VON Heinrich Bergmann. Vienna: A. Hartleben. 1903. 12mo. Pp. 327. Price, \$1.50.

Mr. Bergmann has collected a great number of recipes which should be of value to the metallurgist, particularly since the recipes which he has gathered are such as have proven themselves of practical value.

EMERY GRINDING MACHINERY. A Text Book of Workshop Practice in General Tool Grinding and the Design, Construction, and Application of the Machines Employed. By R. B. Hodgson, A.M., I.M.E. London: Charles Griffin & Co., Ltd. Philadelphia: J. B. Lippincott Company. 1903. 12mo. Pp. 180.

An emery grinder is one of the most useful tools a shop can have, especially as a money saver. The present volume is an admirable contribution to the literature of money machine shop work. Unlike many English technical books, American practice is far from being neglected, and many of the best American types are shown.

WOOD. A Manual of the Natural History and Industrial Applications of the Timbers of Commerce. By G. S. Boulger, F.L.S., etc. London: Edward Arnold. New York: Longmans, Green & Co. 1902. 16mo. Pp. 369. 66 illustrations, 3 plates. Price, \$2.60.

About 750 woods are enumerated in this excellent book, including most of those which are practically known in general commerce. The information is of a very practical nature, dealing with the weights of wood, their hardness and color, odors and resonance, the defects of wood, seasoning of wood, the uses of wood, and a complete catalogue and an excellent bibliography.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending August 11, 1903,

AND EACH BEARING THAT DATE.

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

Table listing inventions with patent numbers, including: Acids, apparatus for making sulphuric or other, J. G. Graham; Advertising novelty, W. A. Demmon; Aerated liquid dispensing apparatus, J. J. McLaughlin; Air brake automatic safety stop, Hughes & Roche; Air brake connection, Feust & Wright; Air brake, railway, P. Jacobson; Air compressor cylinder water jacket, J. H. Herron; Air compressor governor, J. H. Herron; Air inlet for sanitary ventilation of the drainage systems of houses, buildings, etc., fresh, G. Cody; Allmentary paste drying apparatus, J. Alloatti; Alloy and making same, A. Ramsdell; Ammunition holst for ordnance, Dawson & Horne; Amusement device, A. Seyfried; Anchor stowing mechanism, ship, J. Kidd; Anesthetics, device for administering, G. L. Bennett; Animal trap, G. F. Eberhard; Atmosphere, apparatus for automatically controlling the humidity of, O. E. Boggs; Atomizing and carbureting device, W. Sams; Automobile driving gear, K. G. Johnston; Axle, vehicle, J. T. Kenter; Awning operating mechanism, M. F. Wiedemann; Ball ear, vessel, J. F. Vogt; Baking iron, water, Rifkin & Getzoff; Baling machine, straw, G. J. Freese; Ball, See Golf ball; Balls, making hollow, C. Davis; Banana shipping case, F. Schmitz; Bank, E. W. Buechling; Bark removing machine, J. Moreau; Bath seat, W. H. Silver; Bathing apparatus, portable, L. V. Gray; Batteries, treating lead plates for use in secondary, C. J. Reed; Battery electrolytes, composition of matter for, Peto & Cadett; Battery plate and making same, secondary, A. F. Clark; Battery separator, secondary, A. F. Clark; Bed, C. A. Needham; Bed, J. Wyssa; Beehive, F. Danzenbaker; Beet digger, T. F. Fitzsimmons; Bending machine or tool, B. S. Peard; Bicycles, etc., variable gearing for, F. Mitchell; Binder, W. C. Walker; Binder, temporary, M. P. Jackson; Binder, temporary, J. W. Harsha; Blotting pad, W. A. Murray; Blowers or pumps, impeller for rotary, H. A. Walwright; Boiler or other furnace, G. C. Way; Boiler superheater, C. Gottwald; Bolting machine, undulatory, E. R. Draver; Book, index, Seldenticker & Neligh; Books, etc., machine for trimming, E. B. Stimpson; Boot calk, A. B. Lipscomb; Boring machine, A. M. Newell; Bottle cap, E. Norton; Bottle filling and sealing machine, E. D. Schmitt; Bottle, hot water, J. Hollan; Bottle, nursing, M. Cantwell; Bottle soaking machine, S. Volz; Bottle washing machine, Busch, Guil & Barry; Bottle washing machine, V. Lapp; Bow, J. J. Adams; Bowls, manufacture of integral stems and bases for blown, C. G. Drew; Box, A. Gallo; Box or receptacle, L. H. Rogers; Bracket, See Shade and curtain bracket; Brake coupling, automatic fluid pressure, Kelley & Colvin; Branding iron, A. A. Phipps; Bricks, etc., apparatus for drying, C. Berhenke; Brooder, E. Schill; Broom hanger, W. S. De Woody; Brush, M. McCarthy; Brush, automatic screen, M. R. Crofoot;

Table listing inventions with patent numbers, including: Brush back drilling and filing machine, C. E. Flemming; Brush, electric, C. T. Richmond; Building block, H. E. Goodwin; Buildings, construction of hospitals, sanatoriums, or other, D. Sarason; Burglar alarm and sash lock, Handy & Hosford; Burial receptacle, J. C. F. McGriff; Camera back, reversible, F. B. Case; Camera feeding device, magazine, Fyfe & Odquist; Camera focusing hood, La May & Whitlock; Camera, photographic, F. B. Case; Camera, sketching, Beebe & McFarland; Camera, connection for the swinging elements of, F. B. Case; Can bodies, manufacture of key-opening tongued tearing strip, B. H. Larkin; Cans, manufacture of key-opening tongued tearing strip, G. W. Weber; Candle, ornamental, multiple, W. S. De Woody; Candy, pulling, C. Thibodeau; Cap or cartridge receptacle, J. W. Grubbs; Car-coupling, P. Baker; Car coupling, W. S. Yee; Car coupling, J. C. Yelser; Car loader, D. H. Claudon; Car sign, removable street, Coleman & Harner; Car wheels, molding, A. F. Howe; Carbon tetrachlorid, C. Combes; Card holder, S. H. Owens; Card conveyor, E. G. B. Korting; Cartons or the like, machine for setting up and filling, W. H. Doble; Cast steel wheel, T. B. Zell; Caster, C. Stengel; Centering, hanger for temporary, G. B. Waite; Cetyl-galacyl and making same, M. W. Beylik; Chain and sprocket wheel therefor, drive, F. V. Hetzel; Change making apparatus, J. W. Munson; Check and sales slip holder, W. Morton; Chocolate manufacturing machine, E. P. F. Maguire; Circuit breaker, E. P. Warner; Clamp, J. Turck; Clipper, hair, M. S. Black; Cloth cutting machine, E. M. Waring; Clothing hanger, T. D. Sugrue; Clutch, friction, R. M. Phillips; Clutch, hoisting machine, P. F. Dundon; Coal holst, G. Gillroy; Coal or other materials, classifying apparatus for, F. Blanc; Coffee concentrate and making same, S. Kato; Coil spring, V. Meyer; Coin detective, G. W. Brown; Coin holder, P. C. Fish; Coin receiver, E. G. B. Korting; Coke oven door, G. D. Macdonald; Collar shield, horse, B. F. George; Collar throat brace, horse, J. H. Miller; Combing machine, wool, Jackson & Thompson; Commutator brush, C. Wirt; Concentrator, I. Sutton; Concrete building blocks, machine for manufacturing hollow, Borst & Grosco; Concrete construction, steel, W. W. Guest; Concrete mixer, L. G. Haase; Conveyor, A. J. Webster; Conveyor apron, S. G. Toustone; Cooker steam, E. C. Peters; Copy holder, W. H. Peak; Cork retainer, W. E. Brown; Corn fodder shredder, W. H. Beidler; Corset, N. Temple; Corset, T. Schottlander; Cotton gin, A. M. Dastur; Cover, culinary vessel, J. Stone; Crate, folding, B. K. Boyd; Crossing and double slip switch with movable center point, combination, Lee & Moore; Crusher, See Ore crusher; Cultivator, arm rest, H. S. Cole; Cultivator, S. P. Kimball; Cultivator, W. R. Knaub; Cultivator, vineyard or orchard, I. B. Kilgore; Current motor, alternating, F. L. O'Bryan; Cutters, mechanism for driving and adjusting rotary, C. R. Gabriel; Demonstration and instruction strip, combined, F. A. Glidden; Dental mixing tablet, J. N. Woolverton; Dental mouth prop mirror, and tongue projector, W. Hare; Dental tool, G. E. Hough; Desk, portable, J. B. Elliott; Desk, support for attachment to, W. J. Bell; Dish washer, J. Straltzer; Display cabinet, J. L. Tandy; Display rack, T. Rabe; Display stand, C. F. Nye; Diving apparatus, Petrie & Martin; Door check and spring, O. C. Rixson; Door locking attachment, W. H. Gartz; Door, sliding, J. J. Hennessey; Door, sliding, E. E. Manter; Double and single tree, A. C. James; Draft equalizer, F. Bahler; Draft gear, friction, A. Christanson; Dress suit cases or trunks, strap holder for, E. Bienenstock; Dress supporting pin, C. Metternich; Drier, J. H. Morong; Drying apparatus, laundry, J. Lingco; Drill device bearing, O. A. Poirier; Drilling machine, A. Marek; Dust collector, W. A. Derby; Dust collectors, etc., dust proof joint packing for, H. C. Draver; Dye, substantive sulfur, Julius & Reubold; Dynamo gearing for railway vehicles, H. Weston; Edging for open work goods, S. Borton; Egg beater, Smith & Sherwood; Electric brake, H. Halsey; Electric braker, G. A. Le Fevre; Electric circuit, mercury safety attachment for, E. Miles; Electric coil, R. Varley; Electric currents for electrolysis, apparatus for the generation and application of, F. E. Elmore; Electric distribution regulating system, L. Lyndon; Electric heater, J. F. McElroy; Electric motor control, F. A. Merrick; Electric switch, H. O. Swoboda; Electric switch, C. C. Gould; Electrical coil, R. Varley; Electrical distribution regulating system, L. Lyndon; Electrical machine synchronizing apparatus, P. M. Linn; Electrical switch, R. L. Border; Electricity, generating, J. H. Reid; Electromagnet, A. Green; Elevator frame, S. K. Dennis; Elevator gate opening device, H. J. Guth; Embossing or punching machine, H. Casler; Embossing press, C. Seybold; Engine controlling means, Duryea & White; Engine igniting attachment, explosive, J. D. McFarland, Jr.; Engine sparking device, gas, J. M. Wilson; Engines, rebound preventing device for gas, C. Schrotz; Envelop, L. W. Fritzkow; Eyelet setting machine, E. B. Stimpson; Fastener, E. B. Stimpson; Fastening, C. E. Morgan; Faucet, mixing, Ross & Tollinger; Feed mechanism, automatic, White & Duryea; Feed water heater and purifier, R. D. H. Anderson; Feed water heater and purifier, C. K. Cunningham;

Table listing inventions with patent numbers, including: Feet, device for preventing flat, C. L. Darby; Fence, D. F. Beard; Fence feeder and crimper, wire, M. D. Taylor; Fence post, J. & W. H. Beazley; Fence post, F. J. Peterson; Fence post, J. M. Warner; Fence stretcher, wire, I. M. Warner; Fencing, wire, W. Grattan; File, account, E. T. Randle; File cabinet, C. Kline; File, paper, S. Chiger; Filter, L. B. Skinner; Filter, G. W. Johnston; Fire escape, E. Banhael; Fire ladder and escape means, combined, W. Hubartt; Fires, automatic sprinkler for extinguishing, J. G. Grimley; Firearm sight, C. Huber; Fish opening and cleaning machine, T. Morris; Floor, construction, J. Trunzer; Flooring, boarded ceiling, etc., separable, P. B. Guibon; Flue scraper, P. F. Vogt; Fluid pressure engine, M. N. Forney; Fluid transfer switch, E. A. July; Folding box or crate, J. W. Prasky; Folding chair, T. W. Washburn; Freezing the ground, C. SooySmith; Fruit gatherer, L. Scarborough; Fuel, manufacturing artificial, H. C. B. Forester; Furnace distributor, blast, J. Cook; Furnace door, J. S. Cooper; Furnaces, apparatus for feeding pulverized fuel to, J. E. Baldwin; Furnaces, etc., attachment for, A. G. Ingalls; Furniture fixture, C. Franck; Fuse apparatus, protective, W. L. Richards; Fuse box, electric, J. J. Wood; Fused substances, apparatus for the electrolysis of, C. W. Roepper; Gage, See Track gage; Gage, F. T. Cable; Game and toy, W. Maxwell; Game apparatus, C. M. Mumford; Garment hanger, I. Scott; Garment hanger, M. E. Pike; Gas battery, J. H. Reid; Gas engine, H. H. Mulherin; Gas engine, E. B. & L. S. Cushman; Gas fixture, Smith & Warburton; Gas furnace, P. S. Harvey; Gas generator, acetylene, J. McLean; Gas generator, acetylene, W. F. Bolly; Gas heated comb, R. D. O. Johnson; Gas heater, J. C. Goodwin; Glass making, wire, Swearer & Toynebe; Glass ornamenting machine, J. M. Conroy; Glass, working, O. A. Mygatt; Glassware, apparatus for making, M. H. Hart; Gold crowns, apparatus for swaging, Brewer & Bureind, reissue; Golf ball, C. Davis; Governor, N. Lombard; Governor, centrifugal, N. Lombard; Governor, engine, W. O. Worth; Grain cleaning and scouring machine, H. C. Jeffers; Grinding or polishing cone, L. G. Koening; Grinding tracers and tools for engraving machines, machine for, B. Barr; Gripping device, B. W. Truscott; Gums from trees, collecting, J. G. Gardner; Halter and hitching rope, combined, J. M. Little; Hammer, Jinks & Davis; Hand, artificial, H. Patton; Harmonium stop key mechanism, C. Hesse; Harvester binding mechanism, grain, S. K. Dennis; Harvester, broom corn, I. O. Baxter; Harvester, broom corn, J. W. Peifer; Hat or the like, S. H. Meerza; Hatch fastener, T. B. Armstrong; Header, E. A. Johnston; Heat, device for effecting the radiation of, F. T. Clark; Heater, G. W. Brunner; Heating apparatus, D. M. Horton; Hemoglobin preparations, making, F. Hansen; Hide fleshing machine, Lombard & Luce; Hoisting machine, L. 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Johnston; Lamp, electric arc, T. L. Carbone; Lamp, electric incandescent, C. E. Carter; Lamp, gas, W. G. Midgley; Lamp glowers, apparatus for treating electric, M. W. Hanks; Lamp glowers, making electric, M. W. Hanks; Lamp sockets, making fiber insulating linings for incandescent, O. E. Kennedy; Lantern, magic, S. Hamburger; Latch, gate, H. C. Carter; Lathe speed changing mechanism, automatic, J. P. Brophy; Lattice or truss girder, etc., F. Visintini; Leather finishing machine, C. Shepard; Leather ornamenting, Slade & Goldstein; Lemon squeezer, R. L. Dorsey; Lens carriage, laterally adjustable, F. B. Case; Level and plumb, D. F. Colcutt; Liquid cooler, M. A. Connor; Liquid from liquid containing same, apparatus for separating volatile, Erben & Wass; Liquids, apparatus for drawing off or dispensing aerated or other, J. Fletcher; Liquors, purifying alcoholic, J. Howden; Load retaining or releasing means for vehicles, D. McLaughlin; Locomotive air feeding apparatus, F. P. Busiel; Logging jack, J. G. Owen; Loom shuttle, weaver's, E. G. Ferreira; Loom warp stop motion, J. E. Lemyre; Lubricant and making same, S. A. Smith; Lubricator, H. James; Mail bag fastener, J. W. Shallenberger; Manure gatherer and loader, J. Peterson; Mapping instrument, J. F. D. Schrader; Massage implement, J. J. Grobe; Measure, combination, E. H. Darsie; Measure, tailor's tape, J. M. Adamson;

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