

Business and Personal.

Marine Iron Works. Chicago. Catalogue free. For hoisting engines. J. S. Mundy, Newark, N. J. "U. S." Metal Polish. Indianapolis. Samples free. Yankeé Notions. Waterbury Button Co. Waterbury, Ct. Metal Novelties wanted. Bliss Metal Co., Prov., R. I. Write Baker Mfg. Co., Racine, Wis., about pushing any new article. Facilities excellent. Handle & Spoke Mch. Ober Mfg. Co. 10 Bell St., Chagrin Falls, O. Machinery designed and constructed. Gear cutting. The Garvin Machine Co., Spring and Varick Sts., N. Y. Ferracut Machine Co., Bridgeton, N. J., U. S. A. Full line of Presses, Dies, and other Sheet Metal Machinery. For Sale—Patent, foreign and domestic rights Acetylene Generator. Absolutely new invention. Never shown. Address immediately "V," Box 1536, N. Y. P. O. The celebrated "Hornsby-Akroyd" Patent Safety Oil Engine is built by the De La Verne Refrigerating Machine Company. Foot of East 138th Street, New York. The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4. Munn & Co., publishers, 361 Broadway, N. Y.

NEW BOOKS, ETC.

AMERICAN TELEPHONE PRACTICE. By Kemster B. Miller M. E. New York: American Electrician Company. 1899. 8vo. Pp. 458. Price \$2.

There is quite a literature on the telephone but most of them are hopelessly out of date and the practice they stand for is archaic. The present work deals with the subject in a masterly way and tells exactly what the electrician wishes to know about switch-boards and other perplexing points in telephone work. It is an admirable book and is profusely illustrated by diagrams and half-tones taken from the objects themselves. No phase of the subject seems to be neglected.

A MODERN SAFETY BICYCLE. By H. A. Garratt. London: Whittaker & Company. New York: The Macmillan Company. 1899. 16mo. Pp. 224. Illustrations and plates. Price \$1.

The literature in book form upon the bicycle is far from being extensive. The present work was intended to help riders to understand their machines and with the aid of the working drawings, mechanics can build their own machines if they desire to do so. The principles underlying the construction are clearly expressed.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending

MARCH 13, 1900.

AND EACH BEARING THAT DATE.

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

Table of inventions with patent numbers, names, and dates. Includes items like Accumulator, Acid boiling tower, Adjusting device, Advertising device, Air compressor, Alarm mechanism, Amalgamation, Separator for gold and silver, etc.

"Star" Foot and Power Screw Cutting Lathes. FOR FINE, ACCURATE WORK. SENFCA FALLS MFG. CO. 695 Water Street, Seneca Falls, N. Y., U. S. A.

AMERICAN PATENTS.—AN INTERESTING AND VALUABLE TABLE SHOWING THE NUMBER OF PATENTS GRANTED FOR THE VARIOUS SUBJECTS UPON WHICH PETITIONS HAVE BEEN FILED FROM THE BEGINNING DOWN TO DECEMBER 31, 1894. CONTAINED IN SCIENTIFIC AMERICAN SUPPLEMENT, No. 1002. Price 10 cents. To be had at this office and from all newsdealers.

BARNES' NEW FRICTION DISK DRILL FOR LIGHT WORK. Has These Great Advantages: The speed can be instantly changed from 0 to 1600 without stopping or shifting belts. Power applied can be graduated to drive, with equal safety, the smallest or largest drills within its range—a wonderful economy in time and great saving in drill breakage. W. F. & JNO. BARNES CO., 1999 Ruby Street, Rockford, Ill.

FOR FINE WORK No machine on the market can equal our No. 00 Hand Bench Milling Machine with two speed counter. Spindles and bearings of hardened and ground tool steel. Arranged to take same size chucks and other attachments as fit mouth of bench lathe spindle. Traverse movement of table 7 inches. Fuller description in free illustrated booklet. The Pratt & Whitney Co., Hartford, Conn.

THE HALL BRASS PIPE WRENCH. A PERFECT TOOL, WITH FRICTION GRIP. Bushings for all sizes and shapes. Highly polished pipes made up without wear or injury. For Calfworts and Prices WALTHAM MANUFACTURING CO., 128 TO 136 FEDERAL ST., BOSTON, MASS.

NICKEL AND Electro-Plating Apparatus and Material THE Hanson & VanWinkle Co., Newark, N. J. 136 Liberty St., N. Y. 30 & 32 S. Canal St. Chicago.

Buy Telephones THAT ARE GOOD—NOT "CHEAP THINGS." The difference in cost is little. We guarantee our apparatus and guarantee our customers against loss by patent suits. Our guarantee and instruments are both good. WESTERN TELEPHONE CONSTRUCTION CO., 250-254 South Clinton St., Chicago. Largest Manufacturers of Telephones exclusively in the United States. MAXIMUM POWER—MINIMUM COST. If you use a pump for beer, lard, acids, starch, etc. or for blowing, brewer's mash, tanner's liquor, cottonseed oil or fluids, hot or cold, thick or thin you want to get the TABER ROTARY PUMP which does the most work at the least expense. Simply constructed. Can be run at any desired speed. Perfectly durable. All parts are interchangeable. Needs no skilled workman. Defects guaranteed. Catalogue free. TABER PUMP CO., 32 Wells St., Buffalo, N. Y., U. S. A.

NEW BINOCULAR. (The Tripler.) Small as an opera glass. More powerful than the largest field glass. Send for Circulars. QUEEN & CO. Optical and Scientific Instrument Works, 1010 Chestnut Street, NEW YORK: 59 Fifth Ave. PHILADELPHIA, PA.

HOW TO MAKE AN ELECTRICAL Furnace for Amateur's Use.—The utilization of 10 volt electric circuits for small furnace work. By N. Monroe Hopkins. This valuable article is accompanied by detailed working drawings on a large scale, and the furnace can be made by any amateur who is versed in the use of tools. This article is contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 1158. Price 10 cents. For sale by MUNN & Co., 361 Broadway, New York City, or by any bookseller or newsdealer.

The New Yankee Drill Grinder Scientifically Correct. The only drill grinder ever made requiring but one preliminary adjustment. Gage Jaws, Chucks and other time-consuming apparatus hrown to the winds. Any clearance obtained instantly. Drills cut like razors. A boy can use it. Iron Workers! This machine will pay for itself many times each year. Correct work impossible without it. Write us NOW while thinking of it. THE FULLER MFG. CO., Successor to G. T. Farnes Co. 250 Asylum Av., Kalamazoo, Mich.

A. W. FABER. Manufacturing Established 1761. LEAD PENCILS, COLORED PENCILS, SLATE PENCILS, WRITING SLATES, STEEL PENS, GOLD PENS, INKS, PENCIL CASES IN SILVER AND GOLD, STATIONERS' RUBBER GOODS, RULERS, COLORS AND ARTISTS' MATERIALS. 78 Reade Street. - - - New York, N. Y. Manufacturing Established 1761.

MAGNETO BELLS ALL KINDS PARTS OF TELEPHONES ELECTRICAL SUPPLIES SEND STAMP MIANUS ELECTRIC CO. 511 BROADWAY, N. Y. FOR CATALOGUE MIANUS, CONN.

Table of inventions with patent numbers, names, and dates. Includes items like Cotton gin, roller, J. E. Cheesman; Cotton piece goods, fixing the finish on, M. S. Sharp; Coupling. See Car coupling. Hose coupling. Vehicle reach coupling; Cream separator, H. Whitlock; Cultivator plating attachment, S. W. Nelson; Culvert, M. C. Trumbull; Cup. See Grease cup; Current meter, alternating, W. H. Pratt; Current motor, alternating, W. G. Rhodes; Cut off and light extinguishing apparatus, time, automatic, H. L. Groomer; Cut off, automatic, G. Christensen; Cutter. See Cloth cutter. Thread cutter; Cycle seat, T. D. Wilbus; Cyclometer, L. J. Burdick; Cyclometer or registering mechanism, L. J. Burdick; Dashboard, lined, Alexander & Reynolds; Defacing apparatus, liquid, N. J. Deming; Defining machine, J. J. Faulkner; Dental broach, L. A. Young; Dental separator, E. Wishart; Desk, school, Holiman & Fields; Detector. See Coin detector; Disinfectant to water closets, float attachment, for automatically feeding, H. F. Jones; Display rack, H. M. Greener; Door hanger, L. A. Hoerr; Door, sliding, L. A. Hoerr; Drawing board rest, H. W. Roberts; Dress shield fastener, G. W. Ferguson; Drill. See Boring drill; Dry air closet, G. R. Scates; Drying apparatus, C. Mallinson; Dust collector, J. E. Mitchell; Educational appliance, M. Thurston; Elevator circuit, M. Thompson; Electric lighting, producing incandescent materials suitable for, G. A. Severt; Electric meter, L. C. Reed; Electric metering system, L. C. Reed; Electric motor control, W. R. Hamlen; Electric motor control, F. A. Merrick; Electric motors, apparatus for control of, W. R. Hamlen; Electric motors, starting asynchronous and synchronous monophase, E. Cantono; Electrically treating materials, E. G. Acheson; Electrode, battery, F. K. Irving; Electrotypes, machine, B. Jackson; Elevator. See Sign elevator; Enameling table, C. A. Severt; Enameling table or machine, Hoelscher & Clifford; End gate, O. H. Watkins; Engine. See Gas engine. Rock drill engine; Rotary engine. Steam engine; Engine igniter, explosive, J. Jones; Engines, automatic cut off for, J. B. Opsahl; Engraving machine table, N. Dedrick; Engraving machine tool grinder, N. Dedrick; Excavator, A. P. Merrill; Excavator machine, J. H. W. Libbe; Excavator, self loading, J. W. Weaver; Eye-lash, K. M. Thompson; Eyelet, L. A. Roberts; Fabric. See Woven fabric; Fans, hanger for electric ceiling, Ayers & Groth; Faucet, measuring, D. B. Jackson; Fence post, J. D. Paldi; File, newspaper, C. Abrams; File, newspaper, B. R. Green; Filter, C. I. Simpson; Filter, J. F. Ziegler; Firearm, rapid breech loading, J. J. Greenough; Fire kindler, L. Matthias; Fireman's helmet, W. C. Rajen; Fireman's mask, W. Bader; Flour bolt, W. L. Burner; Flour bolt brush operating mechanism, W. L. Burner; Folding machine, O. Laundry; Foot power, Z. McCus; Friction roller, C. C. Catron; Furnace. See Electrotypes furnace. Heating furnace. Reverberatory furnace; Furnace, W. C. Johnson; Furnaces, smoke consumer for steam boiler, H. S. Bowler; Gage. See Tank gage; Gage, W. E. Jones; Galvanizing metals, E. I. Bradnock; Garment hanger, Hall & Donaldson; Garment supporter, J. Sulzbacher; Gas burner attachment, T. J. Bush; Gas generator, A. Heil; Gas generator, J. E. Evans; Gas generator, C. C. Catron; Gas meter, T. H. J. Leckband; Gas regulator, S. L. McAdams; Gas valve, pressure, C. A. Weber-Marti; Gate. See End gate; Gate, Hatfield & Tarr; Gate, A. Lindquist; Gear cutting machine, C. H. Gabriel; Generator. See Gas generator. Steam generator; Glass articles, apparatus for producing hollow, P. T. Sievert; Glassware engraving machine, G. Schiffbauer; Glove washing, B. Potter; Grinding machine, road, E. B. Kirkendall; Grain cleaner, S. H. Trompauer; Grain cleaner, self leveling, J. M. Lasswell; Graphite, manufacturing, E. G. Acheson; Grease cup or lubricator, C. F. Kellom; Grinding machine, S. Brown; Grinding machine, F. Fauser; Grinding mill feed mechanism, roller, A. H. Boelter; Handle. See Kettle tipping handle. Package handle; Hanger. See Door hanger. Garment hanger; Harness, C. B. Olsen; Harness breeching straps, shaft attachment, for, C. B. Corlett; Harvesting machine, J. W. Hull; Hat fastener, F. W. Cammann; Hat or cap rack, E. J. Kirk; Heater. See Tank heater; Heating furnace, S. T. Wellman et al.; Heating motor, R. Rose; Hinge spring, J. Jackson; Hog scraping machine, G. W. Constantine; Hook and eye, S. F. Sull van; Horse heel spreader, J. McDonough; Horseshoe, cushion, A. Simmons; Horses, protector against insects for, Weller & Johnson; Hose coupling, P. H. Reardon; Hose supporter, A. M. Erickson; Husker. See Corn husker; Ice cream, etc., cutter gagefor, T. F. Crowley; Indicator. See Brake indicator. Office indicator; Street indicator; Injection boiler, G. Sticker; Ink well, E. Oldenbusch; Iron, refining, F. W. Hawkins; Jack. See Wagon jack; Jar closure, fruit, A. Smelker; Jar holder, fruit, L. E. Gower; Jewelry, G. Lincks; Jewelry fastener, B. Cramer; Joint. See Rail joint. Railway rail joint. Tube joint; Kettle tipping handle and cover holder, E. Morrison; Kiln, J. & C. Lengsholz; Kite, E. B. & F. W. Merriman; Knife. See Paring and slicing knife; Knitting machine, F. Rosati et al.; Lamp, W. C. Homan; Lamp burner, W. K. Thompson; Lamp, electric arc, W. Vogel; Lamp, gas, M. F. Stevens; Lamp globes, manufacturer of incandescent or other, W. C. Fusner; Lamp wick raising and controlling device, Walbel & Meyrott; Lamps, fastening device for heads of electric glow, J. Kremenezky; Lantern, C. H. Koster; Lathe turning attachment, G. Reynolds; Leaching vat, bark, J. B. Thoms; Leak stopper for vessels, external, A. Colomes; Leather coloring, S. K. Felton, Jr.; Leather dressing, A. R. Dawley; Leather, treating, R. B. Arthur; Level, J. W. Brodhead; Level, plumb, B. C. Morgan; Lighter, pocket, C. M. Campbell; Linotype machine, J. S. Thompson; Linotype machine casting mechanism, C. Holliwell; Linotype machine quad forming attachment, W. H. Doolittle.

(Continued on page 190)

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.

(7844) J. A. C. writes: I connected the Wheatstone bridge with rheostat on one side and a small piano wire about two feet long on the other. The current used was from a small storage battery of four cells. When the piano wire is plucked or bowed so that it vibrates, giving out a musical note, the needle of the galvanometer turns in a direction indicating decreased resistance in the wire. Will you please explain the cause? I was trying to prove that the wire would be warmed by vibrating, but get the opposite result. A. We have verified the statement of this correspondent, and find the same result, with a bridge sensitive to 1000 ohm. When the wire is stretched it shows greater resistance due to its elongation, as it should. When the wire was allowed to vibrate, its behavior seemed to vary with the material. A steel wire showed a decrease of resistance while a German silver wire showed little or no perceptible alteration. Now since the temperature coefficient of German silver is very small, and that of steel is quite large, we suggest the theory that the decrease of resistance is due cooling while vibrating.

(7845) W. M. B. asks: What will preserve gill nets (made of fine gill twine) used in catching shad in the waters of Delaware Bay? We have been using lime water as recommended, but it does not seem to have the desired effect, as the nets become rotten before one season is ended. A. The following treatment is said to preserve nets for a long time in a good condition: Soften 1 pound good glue in cold water, then dissolve it in 10 gallons of hot soft water, with 1/2 pound curd soap. Wash the nets in soft water, then boil them in this for two hours, press out excess of the liquid and hang up over night. The second bath consists of alum, 2 pounds; water, 5 gallons; heat nearly to boiling, and immerse the nets in this for about three hours, then press and transfer to a strong decoction of oak bark or a solution of sumac in warm water (water, 5 gallons; sumac, 8 pounds), and let them remain immersed in this for forty-eight hours or longer, if convenient.

(7846) W. D. H. asks: 1. What is the smallest E. M. F. and current which will produce an arc? A. The counter E. M. F. of the arc is 35 volts. Hence a voltage greater than this is necessary. For direct currents at least 40 volts must be had. For alternating currents, 30 volts is the minimum. Five amperes may perhaps be taken as the minimum current. 2. I would like to produce a small arc light with the smallest possible size of dynamo, using the best and most efficient materials, and built into the most compact form; what would be the approximate size and weight of such a machine? Please give me an estimate, at least, of the size of such a machine. A. The dynamo which would light such a lamp, would require about a half horse power to drive it, and may be taken as of about the size of a half horse power motor. 3. What current is required for the manufacture of calcium-carbide at about 60 volts? A. In the electrical furnaces of the carbide works at Niagara many thousands of amperes are used. We do not know the minimum current for producing carbide. Twenty-five amperes will enable some work to be done. 4. Which is the most suitable for this, the direct or alternating? A. The direct current.

(7847) H. H. S. asks the cause producing "Jack-O-Lantern." A. The ignis fatuus is thought to be due to the spontaneous ignition of a small jet of phosphoreted hydrogen, when it comes into contact with the air. This gas is evolved by the decomposition of matter in swampy places and rises to the surface of the water where it takes fire and burns with a pale light. In the night this may be seen from quite a distance. It has always alarmed the timid and superstitious, but it is in reality a very pretty chemical experiment.