

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

Cheapest Portable Forges. H. Crumlish, Buffalo, N.Y.

Wanted—A Machine for Hackling Corn Husks for making Mattresses. For particulars, address M. Otterbourg, Wilmington, N. C.

The Porter-Allen High Speed Steam Engine. Southwork Foundry & Mach. Co., 430 Washington Av., Phil. Pa.

If your brain is overworked, relieve it by the use of Van Bell's "Rye and Rock."

Correspondence with parties wishing to invest in manufacturing business, now established and requiring more capital, is solicited. Address Box 186, Norwood, N.Y.

The city of Natchez is contemplating the erection of water works, and solicits communications and estimates from parties engaged in that line. Address Henry C. Griffin, Mayor, Natchez, Miss., Lock Box 258.

Abbe Bolt Forging Machines and Palmer Power Hammers a specialty. S. C. Forsaith & Co., Manchester, N. H.

To Lease.—65 horse water power; unfailing; midway between N. Y. and Phila.; railroads, freights, and facilities unequalled. Address John Outcait, Spotswood, N.J.

Save cost of fuel and water, repairs, explosion, burning, compounds, delays, cleaning, and all other evils of impure water, by using Hotchkiss' Automatic Mechanical Boiler Cleaner. 84 John St., N. Y. Send for circular.

The scientific principles involved in the manufacture of the Boomer & Boschert Cider Press will convince every one manufacturing cider that these presses are the best in the world. The prices are very reasonable. Send for illus. cata. to the New York Office, 15 Park Row.

Party owning Sash, Door, and Blind Factory, wishes to add to his manufacture some Specialty (a good patent preferred) which will meet with large and profitable sales. Address X. Y. Z., Box 672, New York city.

Agricultural Engines for sale cheap by S. J. Benedict, East Randolph, N. Y.

Peck's Patent Drop Press. See adv., page 76.

For Sale.—Turret Lathe, with Chaser Bar. No. 1 and 4 Root Blowers. B. & W., 261 N. 3d St., Phila., Pa.

Tarred Roof'g, Sheath'g Felts. Wiskeman, Paterson, N.J.

Supplement Catalogue.—Persons in pursuit of information on any special engineering, mechanical, or scientific subject, can have catalogue of contents of the SCIENTIFIC AMERICAN SUPPLEMENT sent to them free. The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York.

Walrus Leather, Walrus Wheels, Pure Turkey Emery Star Glue for Polishers. Greene, Tweed & Co., N. Y.

List 26.—Description of 2,500 new and second-hand Machines, now ready for distribution. Send stamp for the same. S. C. Forsaith & Co., Manchester, N. H.

Combination Roll and Rubber Co., 27 Barclay St., N. Y. Wringer Rolls and Moulded Goods Specialties.

Punching Presses & Shears for Metal-workers, Power Drill Presses, \$25 upward. Power & Foot Lathes. Low Prices. Peerless Punch & Shear Co., 115 S. Liberty St., N.Y.

Improved Skinner Portable Engines. Erie, Pa.

The Eureka Mower cuts a six foot swath easier than a side cut mower cuts four feet, and leaves the cut grass standing light and loose, curing in half the time. Send for circular. Eureka Mower Company, Towanda, Pa.

Pure Oak Leather Belting. C. W. Arny & Son, Manufacturers, Philadelphia. Correspondence solicited.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J.

Wood-Working Machinery of Improved Design and Workmanship. Cordesman, Egan & Co., Cincinnati, O.

Cope & Maxwell M'fg Co.'s Pump adv., page 45.

Experts in Patent Causes and Mechanical Counsel. Park Benjamin & Bro., 50 Astor House, New York.

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocum & Son's Shafting Works, Drinker St., Philadelphia, Pa.

Malleable and Gray Iron Castings, all descriptions, by Erie Malleable Iron Company, limited, Erie, Pa.

National Steel Tube Cleaner for boiler tubes. Adjustable, durable. Chalmers-Spence Co., 10 Cortlandt St., N. Y.

Corrugated Wrought Iron for Tires on Traction Engines, etc. Sole mfrs., H. Lloyd, Son & Co., Pittsburg, Pa.

Best Oak Tanned Leather Belting. Wm. F. Forepaugh, Jr. & Bros., 531 Jefferson St., Philadelphia, Pa.

For best Duplex Injector, see Jenks' adv., p. 60.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, importers Vienna lime, crocus, etc. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

Presses, Dies, Tools for working Sheet Metals, etc. Fruit and other Can Tools. E. W. Bliss, Brooklyn, N. Y.

4 to 40 H. P. Steam Engines. See adv. p. 61.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 78.

Houghton's Boiler Compound contains nothing that can injure the iron, but it will remove scale and prevent its formation. Houghton & Co., 15 Hudson St., N. Y.

Long & Allstatter Co.'s Power Punch. See adv., p. 77.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 34 Columbia St., New York.

For Mill Mach'y & Mill Furnishing, see illus. adv. p. 77.

50,000 Sawyers wanted. Your full address for Emerson's Hand Book of Saws (free). Over 100 illustrations and pages of valuable information. How to straighten saws, etc. Emerson, Smith & Co., Beaver Falls, Pa.

Telegraph, Telephone, Elec. Light Supplies. See p. 93.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 94.

Safety Boilers. See Harrison Boiler Works adv., p. 83.

Elevators, Freight and Passenger, Shafting, Pulleys and Hangers. J. S. Graves & Son, Rochester, N. Y.

Saw Mill Machinery. Stearns Mfg. Co. See p. 78.

Gear Wheels for Models (list free); Experimental Work, etc. D. Gilbert & Son, 212 Chester St., Phila., Pa.

Gould & Eberhardt's Machinists' Tools. See adv., p. 93.

Blake's Patent Belt Studs. The strongest fastening for leather and rubber belts. Greene, Tweed & Co., N. Y.

For Heavy Punches, etc., see illustrated advertisement of Hiles & Jones, on page 93.

Barrel, Key, Hoghead, Stave Mach'y. See adv. p. 93.

Steam Engines; Eclipse Safety Sectional Boiler. Lambertville Iron Works, Lambertville, N. J. See ad. p. 94.

See Bentel, Margedant & Co.'s adv., page 93.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 93.

Rollstone Mac. Co.'s Wood Working Mach'y ad. p. 94.

For Machinists' Tools, see Whitcomb's adv., p. 94.

Ore Breaker, Crusher, and Pulverizer. Smaller sizes run by horse power. See p. 93. Totten & Co., Pittsburg.

Silica Paints (not mixed); all shades. 40 Bleecker St., N.Y.

For best low price Planer and Matcner, and latest improved Sash, Door, and Blind Machinery, Send for catalogue to Rowley & Hermance, Williamsport, Pa.

The None-such Turbine. See adv., p. 78.

The only economical and practical Gas Engine in the market is the new "Otto" Silent, built by Schleicher, Schumm & Co., Philadelphia, Pa. Send for circular.

Diamond Planers. J. Dickinson, 64 Nassau St., N. Y.

Sewing Machines and Gun Machinery in Variety. The Pratt & Whitney Co., Hartford, Conn.



HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

(1) W. Z. writes: I have a glass vase, 16 inches high, 6 inches in diameter, and an eighth of an inch thick. How can I cut this glass into hoops or rings, each measuring 1 1/4 inches in height? A. Paste a band of thick paper having a smooth edge around the vase so as to mark the line to be cut, and use a good glazier's diamond, the edge of the paper serving as a guide. When cut draw a hot piece of glass rod over the mark, and the ring will separate without breaking. Experiment on a bottle first.

(2) J. C. asks (1) for a recipe for making carbon paper for working the manifold process of copying letters, etc. A. Melt together ten parts of lard and one of wax, and mix with it a sufficient quantity fine lampblack, or lampblack and black lead (graphite). Saturate the paper (unglazed) with this composition, remove excess, and put in a press. 2. Also, how a stylus can be made or got? Will a lead pencil serve the purpose as well? A. A hard pencil will answer, but a stylus of ivory, bone, or steel is preferable.

(3) C. C. L. asks: What is the best machinery in use for manufacturing boneblack? A. A simple crusher, an upright retort furnace, and a variety of sieves constitute the principal part of the plant. See Knight's "New American Mechanical Dictionary," and Hints to Correspondents.

(4) H. E. D. writes: Wood engravers have long felt the want of a simple, reliable, and expeditious formula for photographing on wood for engraving. There are two or three parties that claim to have forms of doing it, but keep them secret. Now, if you could publish anything in the way of a new simple formula, with illustration of special style of printing frame that would be required, you would confer a favor on a number of your readers. A. The subject of photographs on wood for engraving has been treated most comprehensively in the paper by Edward Pocock, in SUPPLEMENT, No. 53.

(5) G. F. asks (1) for a simple method of testing white paints (water colors) to find if they have a lead basis. A. Dissolve a fragment of sodium or potassium in a small quantity of water, add a few drops of dilute sulphuric acid, and hold over the vessel containing the liquid a strip of paper on which is spread some of the moist pigment. If it contains lead it will blacken at once. 2. Will Chinese white (in cakes) turn black by exposure to atmosphere and light? A. If the air contains hydrogen sulphide, yes; not otherwise.

(6) W. K. writes: I want a soft and tough composition that would take the impression of grain from one board to another. A. Try gutta percha softened by hot water or steam; or use fusible metal.

(7) J. N. S. writes: I noticed your advice about using galvanized iron for culinary purposes. I had just purchased a small galvanized wine press, intending to use it also for plum jelly, etc., but never did, as your warning has often been repeated. As the season is now upon us for making up such things, my wife wishes to use the press. Will you please inform me by what simple method I can destroy the coating so as to be safe in using? A. The zinc coating may be removed by scouring with silicious sand well moistened with muriatic acid diluted with three volumes of soft water.

(8) S. G. M. writes: I want to know if there is not some chemical that will fix the lime in whitewash and keep it from washing off by rain and rubbing off by wear. I am aware that milk is used, but it is too expensive here. A. See "A Durable Whitewash," page 52, current volume. Water-glass has been used in this connection with fair results.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

N. D. S.—Traprock and limestone.—S. & P.—Sulphide and arsenide of iron—pyrite and arsenopyrite.—J. W. M.—(Two samples). Feldspathic rock, hornblende, and mica schist, carrying a considerable quantity of graphite (plumbago, black-lead).—E. P.—Your letter contained no minerals, as stated, please send other samples.—L. G. C.—The red is jasper, the other quartz and chalcopyrite—iron-copper sulphide.—Several unlabeled packages of minerals have been received without letters by which we can identify the senders.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH Letters Patent of the United States were Granted in the Week Ending July 12, 1881.

AND EACH BEARING THAT DATE. [Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, will be furnished from this office for one dollar. In ordering please state the number and date of the patent desired and remit to Munn & Co., 37 Park Row, New York city. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications not being printed, must be copied by hand.

Table listing inventions with page numbers: Air compressor valve, E. Hill. 244,127; Air compressors, cold air attachment for, E. Hill. 244,128; Alarm. See Burglar alarm; Album, photograph, Binnechère & Cocharde. 244,357; Amalgamating metals, process of and apparatus for, C. C. Beers. 244,098; Amalgamator, ore, W. H. Howland. 244,240; Appliance for enabling persons to remain under water or in vitiated air, H. A. Fleuss. 244,043; Axle bearing, car, J. R. Baker. 244,107; Axle lubricator, J. V. Randall. 244,299; Bale tie, J. W. Means. 244,140; Baling tie, J. Murtry. 244,068; Battery. See Thermo-electric battery; Bed bottom, spring, W. P. Hennion. 244,055; Bed, hospital, D. J. Powers. 244,073; Bed lounge, G. Snyder. 244,330; Bed lounge, Snyder & Krause. 244,329; Bed lounge, C. Stengel. 244,085; Bed, etc., spring, G. W. Haskins. 244,232; Belt clasp, waist, L. Sanders. 244,149; Belt replacing device, G. P. McConnell. 244,273; Belt shipper, S. Strunz. 244,336; Binder, temporary, G. H. Reynolds. 244,307; Bird cage, J. J. Nichols. 244,284; Blacking box, H. P. Stichter. 244,334; Blast furnaces, process of and apparatus for cleaning and utilizing waste gases of, J. Reese. 244,075; Boiler. See Steam boiler; Boiler furnace, steam, C. I. Hall. 244,051; Boiler indicator and signal, J. G. Logan. 244,267; Boilers, apparatus for cleaning, T. J. Jones. 244,249; Boot and shoe nailing jack, J. Smallwood. 244,083; Boot and shoe sole edge trimmer, Z. Beaudry. 244,037; Boot and shoe sole edges, machine for burnishing and setting, Bradford & Hutchinson. 244,244; Boot and shoe soles, machine for inserting screw-threaded wire in, L. Goddu. 244,046; Bottle wrapper, B. D. Marks (r). 9,797; Bottles, regulator for nursing, W. C. Carpenter. 244,181; Box. See Blacking box. Journal box. Letter box. Brake. See Car brake. Wagon brake; Brouler, reversible, Johnson & Bigelow. 244,060; Broiling by means of gas, apparatus for, G. W. Coleman. 244,187; Bronzing machine, S. Crump. 244,195; Burglar alarm, J. H. Luckhurst. 244,064; Buttons, machine for making shoe, M. M. Rhodes. 244,310; Calorification, process of and apparatus for dynamic, E. Hill. 244,237; Cant dog, W. W. Hills. 244,057; Capsule filler, J. P. Raymond. 244,308; Car brake, H. Walter. 244,343; Car, cattle, J. Rex. 244,076; Car coupler, S. Farnam. 244,213; Car coupling, Arter & Blocher. 244,164; Car coupling, I. Caulk. 244,182; Car coupling, G. Holforty. 244,238; Car coupling, G. W. James. 244,247; Car coupling, J. McCree. 244,138; Car coupling, L. W. Stanley. 244,332; Car heating apparatus, railway, W. C. Baker. 244,108; Car moving device, C. D. Steinly. 244,084; Car, stock, J. Kitsee. 244,258; Car, stock, C. J. Slaughter. 244,326; Car wheels, flask for moulding, W. Fawcett. 244,214; Carbonating apparatus, frame for supporting, J. Matthews. 244,275; Carding machine, J. Tynning. 244,342; Carding machines, mechanism for stripping the flats of, W. H. Rankin. 244,302; Carriage curtain fastener, T. M. Paschal. 244,072; Carriage running gear, M. J. McCue. 244,139; Case. See Leather case; Casting belt hooks, pattern for, S. Budlong. 244,110; Casting pipes and apparatus therefor, drying moulds for, J. K. Dimmick. 244,199; Chair. See Folding chair. Railway chair. Nursery chair. Window cleaning chair; Check book, B. Greensted. 244,049; Christmas tree candle holder, J. W. & A. Geddes. 244,045; Churn, J. Gelbart. 244,226; Cigar machine, W. M. Steidle. 244,333; Clamp. See Saw clamp; Clasp. See Belt clasp. Corset clasp; Clock, electrical, D. F. Sweet. 244,089; Clothes drier, T. G. Saint (r). 9,805; Clothes wringer, C. J. Shirreff. 244,325; Clutch, friction, A. E. Tenney. 244,091; Cock, lock, W. S. & A. D. Holden. 244,130; Coffee and tea pot, J. G. Ewing. 244,213; Coffin, H. Sander. 244,317; Collar fastening, dog, J. M. Riley. 244,312; Colters, hub for rotary, A. J. Manny. 244,362; Concrete and artificial stone, apparatus for moulding, J. C. Sellars. 244,322; Concrete, composition for moulds and composition mould for forming, J. C. Sellars. 244,321; Cooking apparatus, steam, A. E. Campbell. 244,180; Cooler. See Water cooler; Corn husking machine, E. A. Bourquin. 244,177; Corn shock compressor, W. M. Baldwin, Jr. 244,186; Corset, D. H. Fanning. 244,119;

Table listing inventions with page numbers: Corset clasp, Allen & Doolittle. 244,022; Corset fastening, J. M. Beach. 244,171; Cotton gin attachment, W. W. Compton. 244,190; Cotton press, Z. F. Nance. 244,283; Coupling. See Car coupling. Tube coupling; Cradle, folding, C. A. Fenner. 244,217; Cutter. See Straw cutter; Decoy duck, J. Danz, Jr. 244,038; Dental vulcanizing flask, J. S. Campbell. 244,031; Disinfecting and renovating textile and other substances, apparatus for, F. H. Young. 244,354; Diving apparatus, A. Khotinsky. 244,062; Door check, S. A. Armstrong. 244,162; Door spring, C. B. Clark. 244,184; Drier. See Clothes drier. Fruit drier; Drilling machine, multiple, T. T. Prosser. 244,297; Dust pan, E. L. & M. A. Dietz. 244,115; Electric cables, machine for the manufacture of, E. J. Frost. 244,120; Electric plaster, Hubbard & Ashley. 244,242; Electrical conductor, C. E. Ball. 244,167; Electro-magnetic apparatus, M. G. Crane. 244,035; Elevator. See Hydraulic elevator. Washing machine elevator; Elevator, H. Baragwanath. 244,168; Elevator bucket, J. S. Roberts. 244,313; Engine. See Fire engine. Steam engine; Envelope machine, H. D. & O. W. Swift (r). 9,800; Exhaust and ventilating apparatus, S. W. Hudson. 244,243; Fan, S. Scheuer. 244,319; Fare register and recorder, R. M. Rose. 244,314; Faucets to barrels, device for attaching, P. Schofield. 244,320; Feather renovator, H. E. Rowe. 244,148; Feed water heater, I. B. Davis. 244,039; Feed water heater, D. Sullivan. 244,088; Fence post, N. Clute. 244,112; Fence post, J. H. Helm. 244,238; Fence wire, barbed, H. M. Rose (r). 9,798; Fencing, barbed iron, C. K. Marshall. 244,274; Filter, G. Land. 244,262; Fire engine, B. J. C. Howe. 244,131; Fire escape, L. D. B. Shaw. 244,323; Fish and animal trap, combined, J. S. Simpson. 244,150; Flask. See Dental vulcanizing flask; Flower pots, machine for making, G. W. Rathsam. 244,304; Flue cleaning machine, F. W. Gordon. 244,047; Folding chair, J. B. Fenby. 244,216; Folding chair, E. S. Griffith. 244,360; Folding table, E. J. Rawson. 244,306; Framing machine, timber, I. Lepley. 244,134; Fruit drier, J. Taylor. 244,337; Fruit press, F. F. N. Marais. 244,065; Furnace. See Boiler furnace. Hydrocarbon furnace; Furnace grate, W. Brown (r). 9,795; Game apparatus for pool and billiards, portable, J. Sherman. 244,324; Gas apparatus, J. Hanlon. 244,361; Gas apparatus for making, Bell & Lipsey. 244,173; Gas apparatus for manufacturing, Bell & Lipsey. 244,175; Gas apparatus for manufacturing, A. B. Lipsey. 244,266; Gas heater, C. E. Hequebourg. 244,056; Gas producer, Narjes & Willmer. 244,141; Gas tubing, manufacture of, S. Barr. 244,170; Gases under pressure, receptacle for holding, W. M. Jackson. 244,245; Gate. See Railway gate; Gear, T. T. Leacox. 244,264; Generator. See Steam generator; Glass chimney globe, etc., F. M. James. 244,246; Gold in ore, composition for dissolving the coating of, J. F. Sanders. 244,080; Governor, steam engine, J. W. Peck. 244,289; Grain drills, cleaner for the plow points of, J. Saurer. 244,318; Graining machine, J. Hammerl. 244,125; Grate, fire, A. C. Engert. 244,211; Grinding mill, J. A. Moore. 244,363; Hammer, lathing, H. G. Elliott. 244,209; Hand guide for writing, L. M. Beebe. 244,172; Harness pad plate, J. Thomas. 244,338; Harrow, G. H. Johnson. 244,248; Harrow, spring tooth, West & Chase. 244,100; Hat bodies, machine for scalding and sticking fur to felt, E. A. Mallory. 244,271; Hat, sunshade, G. W. Ross. 244,315; Hats, machine for blocking and shaping, R. Etckemeyer. 244,041; Hay press, J. March. 244,272; Heater. See Feed water heater. Gas heater; Hinge, B. S. Atwood. 244,025; Hinge, coach, F. P. Pfeiglar. 244,293; Hinge, spring, Clark & Hart. 244,185; Hinge, trunk, A. C. Frankel. 244,119; Hog scraping machine, R. C. Tompkins (r). 9,799; Hoisting and conveying apparatus, C. S. Kershaw. 244,061; Holder. See Christmas tree candle holder. Thread holder; Hoop cutting machine, F. L. Wilson. 244,155; Horse rake, W. J. Lane. 244,263; Horseshoe nails, machine for making, J. A. Coleman. 244,188; Hubs, machine for manufacturing carriage wheel, C. S. Tilton. 244,097; Hydraulic elevator, E. Thayer. 244,092; Hydrocarbon furnace, J. W. & J. R. Houchin. 244,239; Hydrocarbon furnace, H. S. Saroni. 244,081; Ice machine, T. L. Rankin. 244,300; Indicator. See boiler indicator. Steam boiler indicator; Insects from plants, machine for removing, R. Bollerman. 244,176; Iron, manufacture of copper-plated sheet, C. Haegle. 244,230; Iron, manufacture of galvanized, W. B. Spear. 244,153; Jack. See Boot and shoe nailing jack; Jail or prison, Brown & Haugh. 244,358; Joint. See Rail joint; Journal box, C. D. Crandal. 244,192; Journal box, anti-friction, C. W. Pierce. 244,294; Knife. See Tobacco knife; Knitting machine cam, J. W. Rist. 244,079; Knitting machine cam, A. Wrightson. 244,353; Ladder, telescopic, F. W. Hoefe. 244,069; Lamp, E. S. Piper. 244,142; Lamp, F. A. Taber (r). 9,801; Lamp, electric, H. S. Maxim. 244,277; Lamp, electric, C. G. Perkins. 244,291; Lamp globes, holder or socket for electric, O. Kartznrak. 244,265; Lamps, circuit closer for incandescent, W. Stanley, Jr. 244,331; Land roller and attachment, A. C. Dilday. 244,040; Latch, locking, A. Rand. 244,298; Leather case, A. & H. Hoff. 244,129; Leather finishing machine, F. B. Batchelder (r). 9,974; Leather splitting machine, C. Dancel. 244,196; Letter box, C. Ginesi. 244,227; Lever, straining, J. Corbit. 244,084; Light. See Skylight; Lock. See Nut lock.

Lock strike, J. H. Barnes..... 244,169
 Looms pattern chain bar for, G. Crompton..... 244,113
 Lounge, T. Ramsden..... 244,303
 Lubricator. See axle lubricator.
 Magnet and armature, electro, T. A. Watson..... 244,347
 Magneto-electric machine, J. Olmsted..... 244,287
 Measuring and cutting machine, cloth, A. W. Judd..... 244,253
 Meat slicing machine, G. W. Lower..... 244,270
 Metal, electro-deposition of, P. Higgs..... 244,234
 Metal vessels, machine for making rims for, W. W. Jones..... 244,250
 Metals with zinc coating, H. Roberts..... 244,146
 Millstone dressing machine, C. D. Olmstead..... 244,286
 Millstone face, G. A. Coles..... 244,189
 Motor, T. Mayhew (r)..... 9,804
 Mucilage bottle, E. Knapp..... 244,260
 Music leaf turner, I. Moore..... 244,281
 Musical instrument, mechanical, J. McTammany, Jr..... 244,069
 Netting machine, A. T. Anderson..... 244,159
 Nursery chair, folding, E. S. French..... 244,323
 Nut cracker, M. Renz..... 244,145
 Nut lock, F. B. Kenall..... 244,256
 Oil press mat, Gandy & Brittain..... 244,121
 Oils to burners, reservoir for holding and supplying volatile, H. Fritz..... 244,225
 Ore grinding machine, W. H. Howland..... 244,241
 Ore separator, L. De Soulages..... 244,114
 Organ swell, J. H. White..... 244,351
 Oven shelf, rotary, Youngs & Smith..... 244,255
 Paddlewheel, J. W. Danforth..... 244,197
 Padlock, B. J. Riley..... 244,311
 Pan. See Dust pan. Warming pan.
 Paper bags, machine for making seamless, C. E. Adams..... 244,156
 Paper pulp, machine for treating, A. Forbes..... 244,220
 Pasteboard boxes, pole for handling, J. H. Williamson..... 244,350
 Pen, stilographic, A. T. Cross..... 244,194
 Petroleum reservoir, G. Richter..... 244,078
 Photographic plate holder, J. Thorpe..... 244,339
 Piano action, Elliot & Spike..... 244,210
 Pillow sham frame and holder, J. R. Adams (r)..... 9,703
 Pin tongue, S. Moore..... 244,071
 Piston, H. Waterman..... 244,345
 Planing machines, reciprocating cylinder head for, J. C. & E. J. Pennington..... 244,200
 Planter check rower, corn, G. W. Brown..... 244,178
 Planter, corn, I. P. Watson..... 244,346
 Plow, W. R. Bullock..... 244,179
 Plow, F. T. Pinter..... 244,295
 Plow and cultivator, combined, E. Atkinson..... 244,165
 Plow, sulky, J. I. Hoke (r)..... 9,706
 Post. See Fence post.
 Pot. See Coffee and tea pot.
 Power, mechanism for transmitting, E. L. Smith..... 244,152
 Press. See Cotton press. Hay press. Fruit press. Printing press.
 Presses, friction reversing gearing for, A. A. Gullett..... 244,050
 Printer's chase and stereotype frame, combined, R. Atwater..... 244,024
 Printing press, F. A. Harlow..... 244,053
 Protector. See Stack protector.
 Pulley, friction, W. D. Herschel..... 244,126
 Pump bucket, M. D. Temple..... 244,090
 Pumping artesian wells, apparatus for, W. Skinnerson..... 244,151
 Pumping attachment for barrels, F. I. Maule..... 244,276
 Rail joint, A. W. Kimbrough..... 244,257
 Rail joint, C. W. Levalley..... 244,265
 Railway chair, J. W. Trout..... 244,341
 Railway gate, D. Hamman..... 244,052
 Railways, tension apparatus for cable, H. Root..... 244,147
 Rake. See Horse rake.
 Razor strop, J. R. Torrey..... 244,095
 Refrigerating building, T. L. Rankin..... 244,331
 Refrigeration and machinery for the same, system and method of supplying dynamic, E. Hill..... 244,236
 Register. See fare register.
 Rice beating and polishing machine, J. R. Sample..... 244,316
 Rocker, adjustable, E. W. Andrews..... 244,104
 Roller. See Sand roller.
 Rudder, storm, C. O. Nyquist..... 244,285
 Sand moulding machine, J. D. Delille..... 244,259
 Sash balance, F. F. Westerdahl..... 244,101
 Sash cord fastener, Dunne & Rath..... 244,206
 Sash weight, P. H. Griffin..... 244,123
 Saw clamp, W. H. Johnson..... 244,251
 Saws, device for sharpening band, G. W. Amesbury..... 244,158
 Sawing machine, circular, D. O. Strifer..... 244,335
 Sawing machine, drag, W. McAdams, Jr..... 244,278
 Screw driver, ratchet, L. E. Rhodes..... 244,309
 Scrubbing machine, G. W. McVay..... 244,280
 Separator. See Ore separator.
 Sewing machine, A. E. Choquette..... 244,083
 Sewing machine, F. Wilhelm..... 244,102
 Sewing machine attachment, E. T. Thomas..... 244,093
 Sewing machine attachment, button hole, J. Katzenberg..... 244,254
 Sewing machine binding attachment, I. L. Grinnell..... 244,124
 Sewing machine, button hole, J. S. Freese..... 244,222
 Sewing machine clutch, T. Carey..... 244,032
 Sewing machine feeding device, C. B. True..... 244,096
 Sewing machine presser foot attachment, F. S. Prescott..... 244,074
 Sewing machine shuttle, H. C. Bailey..... 244,106
 Sewing machine take-up, Lorinet & Aubertelle..... 244,268
 Shoe, rubber, R. W. Wilber..... 244,349
 Size or binding composition, C. G. Dodge, Jr..... 244,200
 Skylight, J. M. Lutz..... 244,136
 Spittoon, D. Arndt..... 244,163
 Spring. See Bed spring. Vehicle spring. Door spring. Wagon spring.
 Stack protector, adjustable, J. W. Hoek..... 244,058
 Stamp mill ore feeder, E. W. Wagner..... 244,098
 Staples, device for inserting metallic, H. R. Heyl (r)..... 9,803
 Steam boiler, T. Critchlow..... 244,193
 Steam boiler indicator, D. D. & J. Douds..... 244,204
 Steam engine, P. Lochmann..... 244,135
 Steam engine indicators, cylinder for, J. W. Thompson..... 244,094
 Steam engines, wearing surface of, L. Perkins..... 244,292
 Steam generator, T. & J. Clifford..... 244,186
 Steam generator, water coil, D. Sullivan..... 244,097
 Steam pipes, etc., covering for, R. H. Martin..... 244,085
 Stocking or half hose and method of manufacturing the same, L. Woodward..... 244,352
 Stone, artificial, D. G. Weems..... 244,348
 Stool, camp, J. B. Fenby..... 244,215
 Store counter seat, W. M. Corwin..... 244,191
 Straw cutter, Gordon & De Garmo..... 244,228
 Suppositories, machine for making, E. W. Bing..... 244,030
 Table. See Folding table.
 Tablet, writing, J. F. Dubber..... 244,205
 Tap and faucet, barrel, E. T. Barlow (r)..... 9,802
 Telegraph apparatus, induction, W. L. Silvey..... 244,082
 Telegraph, duplex, S. D. Field..... 244,218
 Telephone, J. A. Lakin..... 244,261

Telephone exchange instrument, E. T. Quimby..... 244,143
 Telephone signal apparatus, Cheney, Jr. & Roper..... 244,111
 Terret, harness, G. F. Eberhard..... 244,307
 Tether, S. W. D. Green..... 244,122
 Thermo-electric battery, P. Higgs..... 244,235
 Thermometer, fever, F. Bahmann..... 244,105
 Thrashing machine elevator, J. Harp..... 244,054
 Thrashing machine feeder, J. Ransford..... 244,144
 Thread holder and cutter, A. J. Winslow..... 244,103
 Tie. See Bale tie. Baling tie.
 Tin cans, device for the manufacture of, J. M. Ward..... 244,344
 Tobacco knife, R. T. Joyce..... 244,252
 Tobacco, machine for attaching tags to plug, A. Markert..... 244,273
 Tongue pipe, C. H. Lovrien..... 244,359
 Toy, combination, G. H. Ireland..... 244,133
 Toy panoramic car, G. H. Ireland..... 244,132
 Traction wheel, T. T. Prosser..... 244,296
 Trap. See Fish and animal trap.
 Trimmer. See Boot and shoe sole edge trimmer
 Truck for moving buildings, J. Minahan..... 244,070
 Tub fastener, S. E. Moore..... 244,282
 Tube. See Well tube.
 Tube coupling, Allison & Hunter..... 244,157
 Valve. See Air compressor valve.
 Valve, balanced, P. Armington..... 244,161
 Valve, rotary, A. Ehret..... 244,208
 Valve, steam engine, P. Armington..... 244,160
 Vault roof, H. Q. French..... 244,224
 Vehicle for transporting live stock, S. D. Reynolds..... 244,077
 Vehicle running gear, J. W. Walker..... 244,099
 Vehicle seat shade, F. M. Mahan..... 244,137
 Vehicle spring, M. L. Gardner..... 244,044
 Vehicle spring, G. Smith..... 244,328
 Vehicle wheel, R. M. Tichenor..... 244,330
 Veneer cutting machine, F. L. Wilson..... 244,154
 Veneering machine, G. S. Graf..... 244,048
 Ventilating and fire extinguishing apparatus, C. Raub..... 244,305
 Wagon brake, D. Grubb..... 244,229
 Wagon, brewer's, C. A. Maus..... 244,067
 Wagon spring, A. Barnes..... 244,109
 Wagon, steam, A. H. Elfers..... 244,117
 Warming pan, J. H. Eagan..... 244,116
 Washing and beating yarn, machine for, P. Dorgeval..... 244,201
 Washing and drying machine, centrifugal, J. H. Biggs..... 244,020
 Washing machine, R. G. Baldwin..... 244,026
 Washing machine, L. F. De Voce..... 24,198
 Water closer and bidet bowl, J. Flanagan..... 244,219
 Water cooler, H. P. Stichter..... 244,086
 Water power, Fountain & McDonald..... 244,221
 Watch cases, mould for centerrims and bezels of, L. Doriot et al..... 244,202
 Watches, jewelling of, C. H. Bagley..... 244,356
 Well tube, drive, W. C. Allison..... 244,023
 Well tubes, check for oil, C. M. Farrar..... 244,042
 Wells, sand and gas shield for oil, T. L. Crowley..... 244,037
 Wheel. See Paddle wheel. Traction wheel.
 Wheelbarrow, A. D. Peck..... 244,288
 Whip socket, C. Christian..... 244,133
 Whistle, automatic steam and air, J. H. Crosby..... 244,036
 Window cleaning chair, A. Dormitzer..... 244,203
 Wire lattice, B. Kücken..... 244,063
 Wood preserving composition, B. Smith..... 244,327
 Wringer. See Clothes wringer.

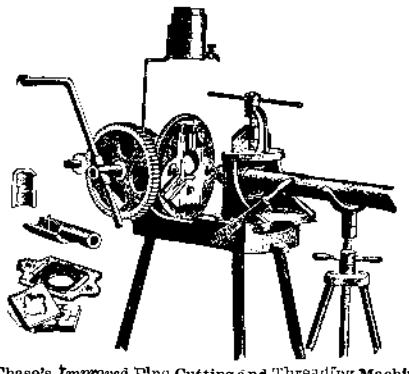
DESIGNS.
 Button and ornament therefor, J. P. Baker..... 12,359
 Carpet, A. McCallum..... 12,358
 Chinaware, set of, Barlow & Moses..... 12,350
 Cloth ornamenting, J. E. Carey..... 12,351, 12,352
 Medal or medallion, R. Armistead..... 12,360
 Oil cloth, enameled and table, G. H. Hughes..... 12,355
 Shawl, J. D. Craig..... 12,353
 Toy safe, Kyser & Rex..... 12,357
 Window shade, J. C. Hamm..... 12,354

TRADE MARKS.
 Annotto, L. E. Ransom..... 8,469
 Beer, lager, Beck & Co..... 8,450
 Bolting cloths, S. Carey..... 8,441
 Bread preparations, Rumford Chemical Works..... 8,453
 Brushes, G. A. Scott..... 8,448
 Cigars, plug and fine-cut chewing tobacco, and snuff, W. Duke, Sons & Co..... 8,444
 Dentifrice, T. Eggersdorff..... 8,445
 Fertilizing compounds, Atlantic and Virginia Fertilizing Company..... 8,454
 Hermetically sealed goods, certain, Crosse & Blackwell..... 8,457
 Jeweler's tools and files, F. W. Gesswein..... 8,446
 Jewelry, certain articles of, Howard & Scherrieble..... 8,460
 Jewelry, certain articles of, F. G. Whitney & Co..... 8,452
 Leather, Kiefer, Stifel & Co..... 8,447
 Liquor, certain spirituous, N. Van Bell..... 8,468
 Paper of all kinds, writing, Z. Crane, Jr., & Bro..... 8,455
 Pencils, lead, E. Faber..... 8,458
 Pickles, mixed, Crosse & Blackwell..... 8,456
 Preserved fruits and vegetables, Farmer's Fruit Preserving Company..... 8,459
 Soap, laundry, Lautz Bros. & Co..... 8,461 to 8,466
 Stoves, cooking and heating, Cochrane, Castle & Co..... 8,449
 Tobacco, plug, chewing, H. G. Cochrane..... 8,442, 8,443
 Whisky, E. H. Taylor, Jr. Company..... 8,467
 Whisky, bourbon, W. H. Livingston..... 8,451

English Patents Issued to Americans.
 From July 5 to July 8, 1881, inclusive.
 Binding attachment for harvesting machines, H. B. Blakemore, Cincinnati, O.
 Car axle lubricator, C. G. Tillet et al., Brooklyn, N. Y.
 Cleaning machinery for fibrous materials, C. A. Dresser, Southbridge, Mass.
 Electro-magnetic motor, M. G. Farmer, Newport, R. I.
 Eyeglass, F. Ferstegen, Elizabeth, N. J.
 Fire extinguisher, F. Grinnell, Providence, R. I.
 Food, preservation of, F. Pool, Charleston, W. Va.
 Fruit preserving apparatus, G. A. Cochrane, New York.
 Furnace, metallurgical, W. Moller, New York.
 Glove fastener, H. M. Peyser, Boston, Mass.
 Grain binding machine, M. A. Keller, Brockport, N. Y.
 Ice machine, T. Rose, San Antonio, Texas.
 Loom, F. O. Tucker, Hartford, Conn.
 Magneto-electric machine, T. A. Edison, Menlo Park, N. J.
 Metals, manufacture of articles from hollow, A. S. Murphy, Philadelphia, Pa.
 Mouldings purifier, K. Smith, St. Paul, Minn.
 Nail machinery, D. J. Farmer, Penn Yan, N. Y.
 Paving block, A. H. Elliott, New York.
 Railway vehicle, Wm. Robinson, Boston, Mass.
 Shoe burnishing apparatus, W. F. Hutchinson, Lynn, Mass.
 Sulphate of alumina, manufacture of, C. Semper, Philadelphia, Pa.
 Telephone, G. S. Anders, Boston, Mass.
 Wagon, railway dumping, M. Van Woomer, Dayton, O.

Advertisements.
 Inside Page, each insertion --- 25 cents a line.
 Back Page, each insertion --- \$1.00 a line.
 (About eight words to a line.)
 Engravings may head advertisements at the same rate per line, by measurement, as the letter press. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

GREAT LABOR SAVING TOOL.



Chase's Improved Pipe Cutting and Threading Machine is the very best made for cutting off and threading Steam and Gas Pipes, Boiler Tubes, Round Iron, Bolts, Nuts, and making Nipples, from 1/4 to 2 inches. No pipe splitting. No bevel inside or outside. No other has automatic cut-off. A boy with this machine, can do more work than two men with old style. Send for circular.

CHASE MACHINE CO., 120 FORT ST., NEW YORK.

McKEAN, NEWHALL & BORIE,
 Philadelphia (Lovering) Sugar Refinery,
 225 CHURCH ST., PHILADELPHIA.

desire to engage a Superintending Chemist, of the best ability, to whom a liberal engagement would be offered.

VARIABLE CUT OFF ENGINE. 25 TO 50 %
 SAVED IN FUEL SIMPLE IN DEVICE
 ECONOMICAL DURABLE MANUFACTURED BY
 BALL ENGINE CO. ERIE PA.

Cooper on the Use of Bolting for the Transmission of Power. With plain, particular, and practical directions for the treatment, care, and management of belts. Demy octavo, cloth, \$3.50.
 E. CLAXTON & CO., 930 Market St., Philadelphia, Pa.

ASPHALTUM. — A COMPREHENSIVE paper, treating of its geological origin, mode of preparation for industrial purposes, and most important applications. Bitumen, Chemical Composition, and Physical Properties. Geographical distribution. Geological origin. Formation of Asphaltum. Bituminous mastic. Uses and applications of Crude Asphaltum. Mode of preparation for sidewalks and pavements. Applications of Bituminous Mastic or Cement. Asphalt as a preservative against fires. Illustrated with engravings, showing the probable formation of asphaltum in soft limestone strata; the construction of pavements by the plant asphaltum process, and the mode of making sidewalks. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 2776. Price 10 cents. To be had at this office and from all newsdealers.

New and Valuable Oiler for Loose Pulleys.
 Its use on Loose Pulleys, especially those running at a high speed, will prove it to be efficient, keeping the pulley oiled from three to four weeks with one filling. Lets no oil on the belt. Guaranteed to give satisfaction. Send for catalogue of engineers' and machinists' specialties. VAN-DUZEN & TIFT, Cincinnati, O.

HAND BOOK FOR STEAM ENGINEERS.
 Indorsed: Knowles Steam Pump Works, Crane Bros. Mfg Co., and others. Price only \$1.00. Address J. H. KERRICK & CO., Publishers, Indianapolis, Ind.

SULPHATE OF SODA. — BY JAMES MAC-TEAR, F.C.S. A history of the former methods of manufacturing sulphate of soda or salt cake, and the inconveniences connected therewith, followed by a detailed description of the author's new mechanical furnace, and of his new continuous system of manufacturing this important chemical product. By the use of the Mactear system thirty per cent. is saved in the manufacturing costs; the operation is continuous, and yields a much more uniform product; the space occupied by the plant is greatly reduced, the escape of deleterious acid fumes is suppressed, and rock salt may be worked quite as easily as common salt. A technical paper of great importance to manufacturing chemists. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 2777. Price 10 cents. To be had at this office and from all newsdealers. The same number contains an article on "New Process for Extracting the valuable oil contained in Sea-weeds," by Messrs. Laurit & Collett.

SKINNERS PATENT COMBINATION CHUCK
 UNIVERSAL INDEPENDENT AND ECCENTRIC
 ALL PARTS ARE MADE INTERCHANGEABLE
 BY SLIDING THE STUD C, THE CHUCK CAN INSTANTLY BE CHANGED FROM UNIVERSAL TO INDEPENDENT & VICE VERSA
 UNION MFG CO. NEW BRITAIN CONN. SOLE MANUFACTURERS
 WAREHOUSE 98 CHAMBERS ST. NEW YORK.

PROFITABLE INVESTMENT.
 A valuable water power, of sufficient force for any manufacturing purpose, together with a handsome tract of land, is generally building thereon, situated in Atlantic County, New Jersey, with direct communication by water to the ocean, and but five miles distant from the nearest railroad station, is for sale under very favorable conditions. Address A. STEPHANY, Egg Harbor City, Atlantic County, N. J.

INDUSTRIAL CHEMISTRY. — BRIEF REVIEW of the most important changes in the applications of, within the last few years. By J. W. Mallet. Treating of: *Materials and Processes Connected with the Construction of Buildings.* 1. Chief building materials for external use, stone and brick. 2. Lime burning, mortar and hydraulic cements. 3. Stucco. 4. Preservation of timber. 5. Glue and other cements of various applications. 6. Pigments for the use of house painters. 7. Vehicles for paints. 8. Varnishes. *Building Appliances.* A. Explosive agents, used in blasting and otherwise. B. Disinfectants. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 2777. Price 10 cents. To be had at this office and from all newsdealers.

BATTERIES, WIRES, MAGNETS, INSTRUMENTS, TELEGRAPH AND ELECTRICAL SUPPLIES, CATALOGUE FREE. C. E. JONES & BRO., CINCINNATI, O.

WATER ELEVATOR, OR STEAM JET PUMP.
 Has no moving parts. With 40 lb. steam will elevate water or other liquids (hot or cold) 50 ft. Cheapest reliable steam jet pump made. Lets no steam into the hose. Always ready for use. For raising water from wells and streams into tanks for Mills and Factories, Tanneries, Soap Works, Railway Water Stations, Mines, etc., a two-inch pump, price \$17.50, with 50 lb. steam, elevates 100 gals. water 30 ft. per hour; a three-inch pump, price \$18.00, elevates 10 ft. 300 gals. All pumps guaranteed. Send for catalogue of engineers' and machinists' specialties.
 VAN DUZEN & TIFT, Cincinnati, O.

GET THE BEST AND CHEAPEST.
 TRADE MARK.
Silver Finish.
 J. A. FAY & CO.
 (Cincinnati, Ohio, U. S. A.)
 Exclusive Agents and Importers for the United States, of the
CELEBRATED
PERIN BAND SAW BLADES,
 Warranted superior to all others in quality, finish, uniformity of temper, and general durability. One Perin Saw outwears three ordinary saws.

SEND TO LONDON, BERRY & ORTON
 PHILADELPHIA FOR
THE BEST BAND SAW BLADE

VENTILATING FAN for PASSENGER ELEVATORS.
 Patent for sale. Has been tested, and is in daily operation. Satisfactory testimonials of efficiency. Apply to LUKE DAVIS, care C. F. Hovey & Co., Boston, Mass.

EUROPE.
 Realizing Patents. Import of American goods into Europe. Representation on Exhibitions.
 R. CAPTAIN, C.E., 178 Boul. Voltaire, Paris (France).

CLARK'S RUBBER WHEELS.



This Wheel is unrivaled in the world for durability, simplicity, and cheapness, and is being largely inquired for and introduced in both this and foreign countries on account of its immense saving of the wear and tear of floors.
 Adapted for Warehouse and Platform Trucks, Scales, Boxes, Baskets, Tables, Heavy Casters, and for all purposes for which wheels are used.
 Send for Circular and Price List.

GEO. P. CLARK,
 Windsor Locks, Conn.

JUST PATENTED. FRUIT AND MEAT Preserved, without heat or chemicals in absolute vacuum. Patent for sale. Address J. C. HODGES, Morristown, Tenn.

A Good Investment.
BEST FOOT LATHES,
 Back geared and screw cutting. Small Lathes, Hand Planers for Metal. Also 36 and 48 in. power. Small Gear Cutters, Slide Rests, etc. Just the articles for business. Highly appreciated. Catalogues free.
 N. H. BALDWIN, Laconia, N. H.

DRUNKENNESS OPIUM HABIT CURED BY LESLIE E. KEELEY, M.D. Surgeon, C. & A. R. R. Dwight, Ill. Books Free.

COILED WIRE BELT & SASH CORD.
 TO THE P.T.P. CO. 328 7th AVE. N.Y.

JUST PUBLISHED. PREPARATION AND USE OF CEMENTS AND GLUE.
 By John Phil. Sent by mail to any address for twenty-five cents. Send for our catalogue of Practical Books. INDUSTRIAL PUB. CO., 14 Dey Street, New York

Agents Wanted. **C4S\$50** S. M. SPENCER, 112 Wash'n St., Boston, Mass.

FOR SALE.
 The entire patent right for a new and valuable improvement in Lamp Lamps; forming a splendid article for manufacture, on which large profits can be made at a small outlay. Address, for full particulars, J. J. HENTZ, 114 South Charles St., Baltimore, Md.

OHIO STATE UNIVERSITY. Mechanical Department.
 The best place in the West to study Mechanical Engineering. Laboratory method shop practice. All modern advantages. Tuition free. Expenses very low. Address Prof. S. W. ROBINSON, Columbus, O.

79 The Cheapest Air Pump EVER OFFERED!
 Cylinder, 1 1/2 x 3 in.; wheels, 10 in.; weight, 25 lb.; 17 1/2 in. high; 8 to 9 gals. per min.; 50 lb. pressure and over. Size 3/4 in. only. Same style, FIVE TIMES AS LARGE, only Twelve Dollars! Will be taken back on order for any larger pump in list within 60 days by
 H. WEINDEL, 405 N. Fourth St., Philadelphia.

SCIENTIFIC BREEDING. — BY J. D. CA- ton. An interesting paper, on the scientific breeding of domesticated animals—especially of the horse, pointing out the astonishing improvements which, in recent years, have been successively wrought by intelligent and judicious selection. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 2773. Price 10 cents. To be had at this office and from all newsdealers. The same number contains the pedigree and performances of "Don Cossack," with a portrait of the animal.

40 Lovely Floral, Paper, Hand & Bouquet Chromo Cards, with name loc. Franklin Art & Co., New Haven, Ct.

50 BEAUTIFUL ALL NEW DESIGNS of Butterflies, Pinks, Pansies, Violets, and Moss Rosebud Chromo Cards, name on, 10c. Card Mills, Northford, Ct.

ELEVATED CABLE RAILWAYS. — Description and illustration of an elevated cable railway, affording an easy and economical method of transporting coal, coke, ores, etc., to any distance regardless of the nature of the surface of the country. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 2770 and 2774. Price 10 cents each. To be had at this office and from all newsdealers.

GARY & MOEN
STEEL WIRE OF EVERY DESCRIPTION
 234 W. 29 ST. EVERY & STEEL SPRINGS. NEW YORK CITY

TRANSPARENT CARDS.
 Make no mistake They are the finest
 70c. ever saw! Each card contains a unique scene. 25 with name on, 10c. Address EUB CARD CO., Boston, Mass.

To Electro-Platers.
 BATTERIES, CHEMICALS, AND MATERIALS, in sets or single, with Books of Instruction for Gold, Silver or Nickel Plating. THOMAS HALL, Manufacturing Electrician, 19 Bromfield Street, Boston, Mass. Illustrated Catalogue sent free.