

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.

Mr. J. O. Hoadley, the eminent practical engineer, referring to H. W. Johns' Asbestos Covering for Steam Pipes and Boilers, says: "I know of no other at once so economical and so effectual."

Chemist's Pocket Book.—For Chemical Manufacturers, Metallurgists, Dyers, Distillers, Brewers, Sugar Refiners, Photographers, etc. By Thomas Bayley. \$2, mail free. E. & F. N. Spon, 446 Broome St., New York.

Machinists wanted.—First-class Fitters or Vise-hands. Williams, White & Co., Moline, Ill.

For Walrus Leather, Bull Neck Emery, Glue, Crocus, and Composition, write Greene, Tweed & Co., N. Y.

To Lehigh Valley Emery Wheel Co., Lehigh, Pa.: "Have tried all known makes of wheels, and yours are the ones we shall use in future." C. H. Filley, V. P. Excelsior Mfg. Co., St. Louis, Mo.

Patent Wanted.—I want to buy whole or part interest, or manufacture on royalty. Address H. C. Lyon, New York.

Manufacturers, Steam Boiler Owners, Towns and Cities desiring pure water, send for circular to the Newark Filtering Co., Newark, N. J.

For Sale Cheap—6 Lathes, 2 Planers, 5 Upright Drills, 1 Fowler Press. All on hand. York & Smith, Cleveland, O.

Malleable and Gray Iron Castings to order, by Capital City Malleable Iron Co., Albany, N. Y.

Electric Lights.—Thomson Houston System of the Arc type. Estimates given and contracts made. 631 Arch, Phil.

For Power & Economy, Alcott's Turbine, Mt. Holly, N. J.

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

Send for Pamphlet of Compilation of Tests of Turbine Water Wheels. Barber, Keiser & Co., Allentown, Pa.

List of Machinists in United States and Canada, just compiled; price, \$10. A. C. Farley & Co., Philadelphia.

Presses & Dies (fruit cans) Ayar Mach. Wks., Salem, N. J.

Latest Improved Diamond Drills. Send for circular to M. C. Bullock, 80 to 88 Market St., Chicago, Ill.

Telegraphic, Electrical, and Telephone Supplies, Telegraph Instruments, Electric Bells, Batteries, Magnets, Wires, Carbons, Zincs, and Electrical Materials of every description. Illustrated catalogue and price list, 72 pages, free to any address. J. H. Bunnell & Co., 112 Liberty St., N. Y.

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

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

The Sweetland Chuck. See illus. adv., p. 450.

"How to Keep Boilers Clean," and other valuable information for steam users and engineers. Book of sixty-four pages. Published by Jas. F. Hotchkiss, 84 John St., New York, mailed free to any address.

4 to 40 H. P. Steam Engines. See adv. p. 392.

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.

Skinner's Chuck. Universal, and Eccentric. See p. 449.

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

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

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

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

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

Learn Telegraphy. Outfit complete, \$4.50. Catalogue free. J. H. Bunnell & Co., 112 Liberty St., N. Y.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 412.

Ajax Metals for Locomotive Boxes, Journal Bearings, etc. Sold in ingots or castings. See adv., p. 449.

Draughtsman's Sensitive Paper. T. H. McCollin, Phila., Pa.

For Rubber Packing, Soap Stone Packing, Empire Packing, and all kinds, write Greene, Tweed & Co., N. Y.

List 27.—Description of 3,000 new and second-hand Machines, now ready for distribution. Send stamp for same. S. C. Forsaith & Co., Manchester, N. H., and N. Y. city.

Machinist Knives for Wood-working Machinery, Book Binders, and Paper Mills. Also manufacturers of Solomon's Parallel Vise, Taylor, Stiles & Co., Riegelsville, N. J.

Rollstone Mac. Co.'s Wood Working Mach'y adv. p. 12.

Common Sense Dry Kiln. Adapted to drying all of material where kiln, etc., drying houses are used. See p. 13.

Peck's Patent Drop Press. See adv., page 30.

For best Portable Forges and Blacksmiths' Hand Blowers, address Buffalo Forge Co., Buffalo, N. Y.

The Brown Automatic Cut-off Engine; unexcelled for workmanship, economy, and durability. Write for information. C. H. Brown & Co., Fitchburg, Mass.

Paragon School Desk Extension Slides. See adv. p. 30.

Fire Brick, Tile, and Clay Retorts, all shapes. Borgner & O'Brien, M'Frs, 23d St., above Race, Phila., Pa.

Clark & Heald Machine Co. See adv., p. 413.

The Chester Steel Castings Co., office 407 Library St., Philadelphia, Pa., can prove by 15,000 Crank Shafts, and 10,000 Gear Wheels, now in use, the superiority of their Castings over all others. Circular and price list free.

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

The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Supplee Steam Engine. See adv. p. 30.

For the manufacture of metallic shells, cups, ferrules, blanks, and any and all kinds of small press and stamped work in copper, brass, zinc, iron, or tin, address C. J. Godfrey & Son, Union City, Conn. The manufacture of small wares, notions, and novelties in the above line, a specialty. See advertisement on page 28.

Brass & Copper in sheets, wire & blanks. See ad. p. 30.

Magic Lanterns and Stereopticons of all kinds and prices. Views illustrating every subject for public exhibitions, Sunday schools, colleges, and home entertainment. 116 page illustrated catalogue free. McAllister, Manufacturing Optician, 49 Nassau St., New York.

New Economizer Portable Engine. See illus. adv. p. 29.

Hand and Power Bolt Cutters, Screw Plates, Taps in great variety. The Pratt & Whitney Co., Hartford, Ct.

For Shafts, Pulleys, or Hangers. call and see stock kept at 78 Liberty St., N. Y. Wm. Sellers & Co.

Ball's Variable Cut-off Engine. See adv., page 30.

Wm. Sellers & Co., Phila., have introduced a new injector, worked by a single motion of a lever.

Saw Mill Machinery. Stearns Mfg. Co. See p. 29.

Tight and Slack Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 30.

Lightning Screw Plates and Labor-saving Tools, p. 30.

Don't buy a Steam Pump until you have written Valley Machine Co., Easthampton, Mass.

Geiser's Patent Grain Thresher, Peerless, Portable, and Traction Engine. Geiser Mfg. Co., Waynesboro, Va.



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.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) J. D. W. asks: What is the cause of steam pipe and fittings corroding and rusting inside? In some cases portions are entirely eaten away until leaks are formed. A. The action noted is attributed to the presence in the steam of much free oxygen and carbonic acid and sometimes sulphites—derived from sulphides present in the water.

(2) W. A. K. asks: 1. How can I transfer a photographic print on glass in order to paint it? A. Try the following: Separate the paper print from the background by steaming it; dry thoroughly, and having given the warmed glass an even coating of clean balsam or negative varnish, place the face of the print on the surface thus prepared, smooth it out, and let it stand in a cool place until the varnish has hardened. Then apply water, and with a soft piece of gum rubber rub off the paper so as to leave the photographic image on the varnished glass. 2. Also, what can I use with sand to make a pavement that will wear equal with brick—the proper quantity given? A. Use hydraulic cement, or cement and water-glass. See "Footwalk Pavements," in SUPPLEMENT, No. 33, and "Water glass," page 16, vol. xlv., SCIENTIFIC AMERICAN.

(3) C. Q. H. asks: 1. How can I purify and clarify beef gall (ox gall) for cleaning and coloring silk, etc.? A. Evaporate the fresh gall to a sirup, and then spread it out in a thin layer on a plate placed near the fire. This is the Pharmocopia plan, but it takes none of the color out of the substance. It simply desiccates the bile, which can in this condition be preserved from putrefaction for any length of time in stoppered bottles. If fresh ox gall is evaporated on a water bath and then treated with alcohol, the mucus and epithelium are precipitated, but the coloring matter still remains, and is not precipitated or discharged by digesting. Again: boil one pint of fresh ox gall with one ounce of alum, and in another vessel a second pint with one ounce of common salt. After standing three months in separate bottles, the clear portion from these solutions is to be mixed for use. But the solutions do not become altogether clear, although they keep well. Ox gall is thoroughly decolorized by acidulating it slightly with acetic acid and passing through it a stream of chlorine gas. 2. Can you tell us how much coal—how many tons—is annually used in the United States for heating and steam making purposes? A. About sixty million tons per annum.

(4) A. L. asks: Will you please give a receipt for making nitrate of iron? A. Iron (scrap), 5½ pounds; nitric acid, 2 gallons. Put the acid into a six gallon pot (stoneware), and gradually add the iron until the whole quantity has been taken up by the acid. It is best to keep the acid warm while dissolving the iron. Silk spirits or nitro-sulphate of iron, sometimes called nitrate of iron, is prepared as follows: Nitric acid (strong), 2 gallons; coppers (iron sulphate), 24 pounds; put the acid in a stoneware pot in a warm place and gradually introduce the coppers. If the acid cannot be conveniently warmed put in a quart of hot water with the acid.

(5) A. J. M. writes: To prevent a horse from cribbing I covered the feed trough with pieces of

rubber such as is used in billiard tables. It has answered the purpose perfectly.

(6) J. V. Q. asks: Is there really such an instrument as a "divining" or "mineral" rod or magnet, by means of which minerals, gold, silver, etc., can be traced in the earth? A. The dipping needle (magnet) is sometimes employed in tracing bodies of magnetic iron ore, but no instrument has yet been devised that has proved of any practical value as a means of prospecting other ores or metals.

(7) B. & B., of O., have in a coal house adjoining a mill 2,000 bushels of slack and nut coal, from which they use 40 bushels per day. The mass is beginning to heat. Is there danger of the coal taking fire? A. Many instances of spontaneous combustion of coal, probably always containing pyrites, are on record. Probably in this case sufficient warning of real danger would be given in the daily inspection.

(8) W. M. B. asks: What are the proportions between iron and copper. If accidentally in contact in a liquid, will a current leave the iron for the copper? A. Iron is more electropositive than copper. When immersed in a liquid conductor and connected by a wire a current of electricity passes from the iron to the copper through the liquid and back again to the iron through the wire.

(9) R. E. M. asks: 1. How to make enough varnish for a violin; some kind that will not be affected by the moisture of the chin? A. See receipt on page 394, answer No. 2, vol. xlv. 2. Are the rivets of large boilers, such as steamboat, railway, etc., hot or cold when they are being riveted? A. Hot.

(10) C. O. N. asks: Can you tell me of some remedy for a watch that has been affected by electricity in visiting the engine room of an electric machine? A. You can demagnetize your watch by placing it in a helix connected with a strong battery or magneto machine, by rapidly reversing the current passing through the coil and at the same time gradually diminishing the strength of the current until it is nil.

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

J. W. B.—The mica is probably worth developing; good sheets would be worth from 25 cents to \$2 a pound. See "Mica and its Utilization," page 257, vol. xlv.—W. J. K.—A bituminous substance, probably deposited from an alkaline liquid.

INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending December 27, 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 1836, will be furnished from this office for 25 cents. 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 various inventions with their patent numbers and dates. Includes items like Abdominal supporter, Adding machine, Animal traps, Annunciator, Attrition mill, Automatic gate, Baling press, Barrel cover, Barrel windlassing machine, Basket, folding cotton, Bed or mattress supporting frame, Belt, drive, B. H. Stiles, Belting machine, Berth, self-leveling, Berth, sleeping car, Bicycle, J. Amess, Bit, Bluing paddle, Boat, Boiler for domestic purposes, Boiler testing apparatus, Boot and shoe crimping board, Boot and shoe nailing machine, Boot strap, Bottle, glass, W. H. Fuller, Bottles, instrument for opening internally stoppered, Box, See Sluice box, Box fastener, G. L. Jaeger, Box fastener, G. Martell, Box nailing machine, J. H. Swift, Bride bit, J. A. Fairbanks, Broiler, D. A. Dickinson, Bucket, well, W. T. Hendricks, Buffering machine, J. H. Stevens, Building, J. R. Rhinehart, Burial case, M. Goff, Button hole finishing tool, J. McGulgan, Calipers, G. B. Webb, Cap, P. Goldmann, Carbureting apparatus, G. W. Crowell, Carburetor, W. T. Barry, Car coupling, E. H. Janney, Car coupling, D. Keethler, Car coupling, H. Merz, Car draw bar, railway, A. L. Anderson, Car starter, C. W. Stiff, Car ventilator and air purifier, railway, F. A. Bruns, Car wheel, S. H. Walz, Cars, draught and buffing apparatus for railway, Coulter & Hibbert, Cars, ventilating window for railway, J. M. Forbes, Card, sample, W. A. Lavery, Carpet beating machine, J. Spaulding, Carriage bow top, L. Murray, Carriage jack, H. H. Brundage.

Table listing various inventions with their patent numbers and dates. Includes items like Carriage top, L. Schmetzer, Carrier, See Egg and fruit carrier, Case, See Burial case, Chair, See Child's chair, Convertible chair, Folding chair, Chandelier, electric, T. A. Edison, Chandelier, extension, J. T. Bruen, Chandelier hook, C. Maschmeyer, Child's chair, seessaw wagon, and swing, combined, T. C. Keeler, Chisel, mortising, A. E. Rowley, Cigar bunch press, E. Toman, Clay crusher and separator, Wallace & Kramer, Cleaner, See Stove pipe cleaner, Clock escapement, C. Reinhardt, Clock movement, W. E. Doolittle, Clock movement, A. E. Hotchkiss, Clock pendulums, suspending, H. H. Ham, Jr., Cockeye and clip, C. L. Lewis, Collar pad, horse, F. F. Gamme, Coloring matter or dyestuff, H. Baum (r), Cotter, plow, A. J. Kersh, Conductor, underground, T. A. Edison, Convertible chair, B. C. Wilson, Cooker, feed, J. W. Gilmore, Cooking apparatus, steam, D. Grove, Cooling or congealing liquids and separating crystals therefrom, process of and apparatus for, W. Bell, Cork drawing machine, A. Muir, Cornice, curtain, G. Baldwin, Corset, M. Adler, Coupling, See Car coupling, Thill coupling, Thill and pole coupling, Crusher, See Clay crusher, Grain crusher, Cuff holder, F. Bain, Cultivator, A. Creech, Cultivator, A. Tschop, Cut-off, T. Clark, Cutter, See Thread cutter, Dash board, A. Z. Boda, Dental bit holder, H. C. Register, Dentist's broach, O. Johanson, Die, See screw cutting die, Door check, G. W. Winters, Door spring, P. K. O'Leary, Dovetail tonguing and grooving machine, F. Chichester, Dredging machine, C. J. Allen, Dress fitting, adjustable support for persons during, C. F. Bartlett, Drier, See Fruit drier, Grain drier, Drop light, electrical, T. A. Edison, Basel, telescoping, A. Herzog, Egg and fruit carrier, J. J. McIntire, Electric light, T. A. Edison, Electric lighting system of, T. A. Edison, Electric machine, dynamo, T. A. Edison, Electric machines, regulator for dynamo, T. A. Edison, Electric machines, regulator for magneto or dynamo, T. A. Edison, Electric meter, T. A. Edison, Electrical generation and distribution, system of, H. S. Maxim, Electrical governor, T. A. Edison, Electro-magnetic motor, T. A. Edison, Elevator, See Water elevator, Embroidering and apparatus therefor, method of, J. Halter, Embroidery machine, E. Ross, End gate, wagon, S. D. Davis, Evaporator, J. C. Gunn, Fan, fly, T. A. Martin, Fanning mill, T. M. Hutches, Fare register and recorder, N. A. Ransom, Fence, barbed, G. E. Barker, Fence, portable, J. Giger, Fertilizing compound, E. J. Houser, Filtering liquids, apparatus for, J. B. Moore, Fire extinguishing apparatus, H. S. Maxim, Flour packers, attachment to, J. P. Ward, Flux, H. Glass, Folding chair, E. J. Smith, Frame, See Bed or mattress supporting frame, Pocketbook frame, Roving frame, Fruit drier, R. E. Burns, Fuel and process of manufacturing the same, G. S. Page, Furnace, H. R. Taylor, Gas pressure regulator, R. F. Hatfield, Gate, See Automatic gate, End gate, Generator, See Steam generator, Glove fastener, W. D. Thompson, Glove fastening, A. Bottger, Glove, husking, J. F. Glidden, Grain crusher, J. & R. Reid (r), Grain drier, E. Louis, Grater, nutmeg, A. E. Francis, Grinding and amalgamating pan, F. A. Huntington, Grindstone tool holder, G. G. & B. D. Bayha, Guano, manufacture of fish, G. B. Oakes, Guard, See Pendulum guard, Railway stock guard, Gun, magazine, A. F. Bellinger, Hair, treating hog, J. Lippincott, Halter for horses, E. Barnard, Hammock and frame, portable covered, N. Vizehlich, Handle, See Tinware handle, Harrow, J. W. & S. H. Cawley, Harrow, M. Daley, Harrow, E. W. Herendeen, Harvester binder, S. D. Locke, Harvester finger, C. J. Johnson, Hat sizing and scalding machine, J. R. Russell, Hats, beating up machine for making napped, J. R. Russell, Hats, machine for sticking naps on felted, J. R. Russell, Hay knife, H. O. Turner (r), Headlight, C. T. Ham, Hinge, automatic gate, W. Hull, Hinge, spring, G. L. Jaeger, Hog nose trimmer, S. & F. Lane, Holder, See Cuff holder, Dental bit holder, Grindstone tool holder, Lead and crayon holder, Rein holder, Sash holder, Hook, See Chandelier hook, Horseshoe, G. H. Reynolds, Horseshoe nail blanks, manufacture of, G. W. Miller, Indicator, See Station indicator, Indigo blue, manufacture of soluble derivatives of, A. Baeyer, Indigo, manufacture of artificial, A. Baeyer, Indigo, preparation of new material for the manufacture of artificial, A. Baeyer, Inking pad, R. H. Smith, Insulated cables, manufacture of covered wire for, H. A. Clark (r).