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.

☞ *The publishers of this paper guarantee to advertisers a circulation of not less than 50,000 copies every weekly issue.*

Best American Shot Gun made is the "Colts." Far superior to any English guns for the same price. For description, see SCI. AMERICAN of May 29. Send for circular to Hodgkins & Haigh, Dealers in General Sporting Goods, 300 Broadway, New York.

Lubricene, Gear Grease, Cylinder and Machinery Oils. R. J. Chard, 6 Burling Slip, New York.

Wilson's Business Directory, second edition, and Wilson's Co-partnership Directory for 1880-81, are now ready. Price, $3 each. All orders addressed to the Trow City Directory Company, No. 11 University Place, New York, promptly attended to.

The Oriental Hotel, the largest of all the immense hotels at Manhattan Beach, the Pequot House, New London, Conn., the Old Orchard Beach Hotel, Maine, are now being painted with H. W. Johns' Asbestos Liquid Paints. H. W. Johns M'f'g Co., 87 Maiden Lane, New York, are the sole manufacturers of these paints, which are rapidly superseding all others for large and elegant structures, and for the better classes of dwellings everywhere.

$400 Vertical & Horizontal Engines, 30 H.P. See p. 349.

$5 to $20. A County Right. A Clothes Line Fastener. Sample by mail, 20 cents. J. A. Worley, Cleveland, O.

Free-stone Quarrying Machinery wanted. Circulars, etc., to Box 2606, P. O., Toronto, Ontario.

Oil Cups, $1.50 per dozen. Liberal discount per gross. Send ten 3c. stamps for two samples. James D. Foot, 78 Chambers St., New York.

Improved Solid Emery Wheels and Machinery, Automatic Knife Grinders, Portable Chuck Jaws. *Important*, that users should have prices of these first class goods. American Twist Drill Co., Meredithville, N. H.

Silhouette.—I want a Silhouette Instrument. Address Geo. C. Henning, Washington. D. C.

Suction Fans or Blowers, $10 to $30. Send for circular. R. K. Teller, Unadilla, N. Y.

When you can't get the particular pen of Esterbrook's that you want, write to The Esterbrook Steel Pen Company, 26 John St., New York, for it.

Asbestos Board, Packing, Gaskets, Fibers, Asbestos Materials for Steam & Building Purposes. Boiler & Pipe Covering. Asbestos Pat. Fiber Co., limited, 194 B'way, N.Y.

Information and Recipes on Industrial Processes.—Fruit Drying and Preserving. Inks and Dyes. Ice Making. Cements. Blacking. Waterproofing. Fireproofing. Paints and Lacquers. Preparing Textile Materials. Cleansing and Bleaching. Vinegar and Wine Making. Sugar Making. Tempering and Hardening etc., etc. Park Benjamin's Expert Office, 49 and 50 Astor House, N. Y.

Air Compressors, Blowing Engines, Steam Pumping Machinery, Hydraulic Presses. Philadelphia Hydraulic Works, Philadelphia, Pa.

Geared Power Press, cost $450, for $200. York & S. Clev. O.

Sweetland & Co., 126 Union St., New Haven, Conn., manufacture the Sweetland Combination Chuck.

Power, Foot, & Hand Presses for Metal Workers. Moderate prices. Peerless Punch & Shear Co., 52 Dey St., N.Y.

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

Corrugated Traction Tire for Portable Engines, etc. Sole manufacturers, H. Lloyd, Son & Co., Pittsburg, Pa.

For the best Stave, Barrel, Keg, and Hogshead Machinery, address H. A. Crossley, Cleveland, Ohio.

For Middlings, Mill and Mill Furnishing, see adv. p. 348.

Collection of Ornaments.—A book containing over 1,000 different designs, such as crests, coats of arms, vignettes, scrolls, corners, borders, etc., sent on receipt of $2. Palm & Fechteler, 403 Broadway, New York city.

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

National Steel Tube Cleaner for boiler tubes. Adjustable, durable. Chalmers-Spence Co., 40 John St., N. Y.

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

Stave, Barrel, Keg, and Hogshead Machinery a specialty, by E. & B. Holmes, Buffalo, N. Y.

Steel Figures, $1; Letters, $3 a set. York & S., Clev., O.

Solid Emery Vulcanite Wheels—The Solid Original Emery Wheel—other kinds imitations and inferior. Caution.—Our name is stamped in full on all our best Standard Belting, Packing, and Hose. Buy that only. The best is the cheapest. New York Belting and Packing Company, 37 and 38 Park Row, N. Y.

Sheet Metal Presses. Ferracute Co., Bridgeton, N. J.

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

For Patent Shapers and Planers, see ills. adv. p. 316.

Wright's Patent Steam Engine, with automatic cut off. The best engine made. For prices, address William Wright, Manufacturer, Newburgh, N. Y.

Presses, Dies, and Tools for working Sheet Metal, etc. Fruit & other can tools. Bliss & Williams, B'klyn, N. Y.

Bradley's cushioned helve hammers. See illus. ad. p. 334.

Electrical Indicators for giving signal notice of extremes of pressure or temperature. Costs only $20. Attached to any instrument. T. Shaw, 915 Ridge Ave. Phila.

Rollstone Mac. Co.'s Wood Working Mach'y ad. p. 300.

Instruction in Steam and Mechanical Engineering. A thorough practical education, and a desirable situation as soon as competent, can be obtained at the National Institute of Steam Engineering, Bridgeport, Conn. For particulars, send for pamphlet.

Hydraulic Jacks, Presses and Pumps. Polishing and Buffing Machinery. Patent Punches, Shears, etc. E. Lyon & Co., 470 Grand St., New York.

For Mill Mach'y & Mill Furnishing, see illus. adv. p. 317.

Forsaith & Co., Manchester, N. H., & 207 Centre St., N. Y. Bolt Forging Machines, Power Hammers, Comb'd Hand Fire Eng. & Hose Carriages, New & 2d hand Machinery. Send stamp for illus. cat. State just what you want.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 316.

For Separators, Farm & Vertical Engines, see adv. p. 316.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 317.

Machine Knives for Wood-working Machinery, Book Binders, and Paper Mills. Large knife work a specialty. Also manufacturers of Soloman's Parallel Vise. Taylor, Stiles & Co., Riegelsville, N. J.

For Alcott's Improved Turbine, see adv. p. 284.

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

For Standard Turbine, see last or next number.

For Power Paper, Lard, Cider Presses, see adv. p. 348.

Burgess' Non-conductor for Heated Surfaces; easily applied, efficient, and inexpensive. Applicable to plain or curved surfaces, pipes, elbows, and valves. See p. 284.

Eagle Anvils, 10 cents per pound. Fully warranted.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Wanted—The address of 40,000 Sawyers and Lumbermen for a copy of Emerson's Hand Book of Saws. New edition 1880. Over 100 illustrations and pages of valuable information. Emerson, Smith & Co., Beaver Falls, Pa.

Eclipse Portable Engine. See illustrated adv., p. 349.

Tight and Slack Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 349.

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

Telephones repaired, parts of same for sale. Send stamp for circulars. P. O. Box 205, Jersey City, N. J.

For Wood-Working Machinery, see illus. adv. p. 348.

Telephones.—Inventors of Improvements in Telephones and Telephonic Apparatus are requested to communicate with the Scottish Telephonic Exchange, Limited, 34 St. Andrew Square, Edinburgh, Scotland. J. G. Lorrain, General Manager.

Pat. Steam Hoisting Mach'y. See illus. adv., p. 348.

Milling, Profiling, Cam Cutting, Revolving Head Screw Machines. Pratt & Whitney Co., Hartford, Conn.

C. J. Pitt & Co., Show Case Manufacturers, 226 Canal St., New York. Orders promptly attended to. Send for illustrated catalogue with prices.

4 to 40 H. P. Steam Engines. See adv. p. 348.

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

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

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.

Elevators.—Stokes & Parrish, Phila., Pa. See p. 348.

Mackenzie Cupola and Blower. The very best apparatus for melting iron; and with water bosh for smelting lead, silver, or copper ores. Send for pamphlet. Smith & Sayre Manuf. Co., 21 Courtlandt St., New York.

Ore Breaker, Crusher, and Pulverizer. Smaller sizes run by horse power. See p. 365. Totten & Co., Pittsburg.

Penfield (Pulley) Block Works. See illus. adv. p. 348

NEW BOOKS AND PUBLICATIONS

THE SUGAR BEET. An illustrated quarterly paper, devoted to the cultivation and utilization of the Sugar Beet. Philadelphia: Henry Carey Baird & Co. Price 50 cents per annum.

It is seldom that a new industry, or even an old and well established industry, is favored with so handsome and able an exponent. The Sugar Beet would seem to be indispensable to every one interested in the raising of beets and the production of sugar from them. The editors say that the curse of American beet sugar making is amateurism and experimenting. Better stick to the successful plans and processes of the French and German leaders in this industry.

Notes & Queries

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. O. D. asks: 1. Will a pump working water from a heater into a boiler work in air if the supply is not sufficient to keep the pipes full? A. Yes. 2. Will the air do any harm? A. No, it would rather be an advantage.

(2) A. P. W. asks: 1. Would a cylinder, 3 inches diameter, 4½ inches stroke, run a side wheel boat, 12 feet long, 3 feet wide, working direct from the shaft (oscillating cylinder)? A. Yes, probably at a speed of about four miles per hour. 2. Can you tell me where to obtain the mercury flasks used in making the boiler described in SUPPLEMENT, No. 182? A. Any druggist can obtain mercury flasks for you. You may also get them from manufacturers of vermilion.

(3) J. W. C. writes: I have a battery of 32 cells (about one pint each) composed of carbon and zinc, but I cannot find the proper solution to make it work properly. I have just amalgamated the zinc very carefully, and used a solution made of the following: 1 gallon sulphuric acid, 3 gallons water, then dissolved 6 lb. of bichromate of potash in 2 gallons of boiling water, mixing the whole, and using when cold. I find that I get a very powerful spark, but not the burning heat that is required when one takes hold of handles attached to the two poles of the battery. And also, I find that the amalgamating substance has entirely disappeared. The battery, I understand, is a modification of Storms' element. Please tell me whether you think I have used the proper solution or not. The zinc and carbon are suspended in the cell about three-eighths of an inch apart. A. Your solution contains too much sulphuric acid. The following will be better: Dissolve 2 lb. bichromate of potash in 10 quarts of hot water. When cold add slowly and carefully 1¼ lb. of sulpburic acid. By using an interrupter you will be likely to feel the effects of the current from your 32 cells. By employing a small induction coil having an interrupter, in connection with a single cell of your battery, you will get a secondary current that can be felt without any difficulty.

(4) H. C. B. writes: 1. I have constructed a pantograph as described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 158, page 2506. I have no trouble in copying any drawing, either enlarged or reduced in size, but I have not been able to make a drawing the same size as the original. Will you have the kindness to tell me how to arrange the tracing point and pencil, so as that I can make a copy of the same dimensions as the original? A. Change places with the pivot and tracing point; that is, put the tracing point in the center of the middle bar. The tracing will be inverted. 2. Can you give me a good receipt for ebonizing wood? I would like the one which is now used by furniture makers. A See p. 19 (18), Vol. 40, SCIENTIFIC AMERICAN. 3. What is the best wood to use for small articles, such as hanging cabinets, which are to be ebonized? A. Mahogany, holly, maple, black walnut, in fact almost any wood may be ebonized.

(5) T. M. asks: 1. What is the velocity of steam under some certain pressure? A. Velocity flowing into the atmosphere at 30 lb. pressure above atmosphere, 1,400 feet per second; 50 lb. pressure above atmosphere, 1,429 feet per second; 70 lb. pressure above atmosphere, 1,444 feet per second. 2. Is there any difference in the velocity of steam through different sized pipes? A. No difference except that due to difference of friction in pipes.

(6) H. D. writes: I have a side wheel steamboat here that is geared up; the wheels are 10 feet diameter, buckets 11x30 inches, dip 14 inches; the engine is geared up to make 4½ revolutions to the wheel's one; the large gear wheel has wood teeth. There seems to be a good deal of back lash and noise. I want to stop it, or help it, if raising up the buckets would make any difference. A. Raising the buckets would relieve but not remedy the difficulty. Put a fly wheel on the crank shaft of the engines, or fit the gearing closer.

(7) E. G. S. asks how to test his steam boiler by hydraulic pressure. A. Fill the boiler entirely full of water by any convenient means, then with a force pump increase the pressure to the desired degree. Use a pressure gauge on the boiler to indicate the pressure produced within the boiler. Place an air cock or valve in the highest part of the boiler, and be sure all the air has been expelled before you close it.

(8) A. K. E. writes: 1. I desire to make an induction coil 8 inches long with ¾ inch iron wire; core in center wound round with about 7 layers of No. 18 cotton covered wire; and have a large spool to slide over this wound up with about 18 layers of No. 36 silk covered wire, and use a single Grenet battery such as is used in all electrical medical machines, and would like to know how many persons could be charged with this size of coil and receive a reasonable charge. A. Two or three layers of No. 16 wire would be better for the primary than seven layers of No. 18. Such a coil would be altogether too large for giving shocks. It would, if well made, give shocks that might prove dangerous. You will find full instructions for making induction coils in SUPPLEMENT 160. 2. How could I make a shocking attachment for same? A. The arrangement of the interrupter is shown in the article referred to. 3. What acids are used for making brass black and how used? A. See p. 371, Vol. 40, SCIENTIFIC AMERICAN. 4. I have often heard that 9 or 10 bells (electric) can be made to ring on the same circuit. Is it true, and if so, how are the connections made? A. Use single stroke bells.

(9) A. S. P. asks for M. Pellet's method of producing blue lines on white by photo process. A. Chemically pure ferricyanide of potassium, 1 oz.; citric acid, 20 grains; dissolve in 5 ounces soft water. Immerse the paper in this, dry in the dark, expose under a negative, develop in a dilute aqueous solution of ferric chloride, wash in plenty of water.

(10) J. T. W. writes: 1. I have just read your article in the SCIENTIFIC AMERICAN SUPPLEMENT descriptive of the steam yacht Flirt. As you kindly consent to supply further information upon application, I make bold to submit a few queries. The text says: "The furnace is cylindrical, 11 inches diameter, and 16 inches long. The upper end of grate is about 11 inches from top of furnace." There must be an error, since that would bring the grate to the top of furnace. A. This is evidently an error or misprint, as the drawings show. 2. Does the stuffing box of the pump serve for guides, or are there guides besides that? A. The stuffing box is the guide. 3. About how much fuel and what kind does she consume? A. With sharp draught it might burn 25 to 35 lb. per hour less with the ordinary draught. 4. The grate surface, 1 square foot, and heating surface 34 feet, seem small for the quantity of steam consumed. Are these the correct figures? A. We would advise you to increase the boiler 25 per cent. 5. What would the complete machinery (boiler, engine, shaft, propeller, and connections) such as that of the Flirt cost (leaving out the nickel plating)? For how much could the machinery of the Flirt be purchased, if at all? How much would an engine not plated, the size of the Flirt's, cost, not including the shaft, propeller, and boiler? A. Complete about $280, without shaft and propeller about $240.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

May 4, 1880,

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.

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