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.

Ladies who board or live in hotels, will do well to secure one of Frothingham & Emery's Patent Portable Safety Jewel Cases. Attachable to bureau drawers, etc., keeping secure jewelry and ornaments from dishonest domestics. Manufactured at 20 Vesey St., New York city. See advertisement on last page.

For Sale.—A 10 H. P. Wood and Mann Portable Engine and Boiler, in good condition. The E. Ingraham & Co., Bristol, Conn.

Books for Engineers and Mechanics. Catalogues free. E. & F. N. Spon, 446 Broome St., New York.

Repairs to Corliss Engines a Specialty. L. B. Flanders Machine Works, Philadelphia, Pa.

Driving Clocks for Equatorial Telescopes. Address Th. Fischlein, 158 Pavonia Ave., Jersey City, N. J.

Inventors, Attention.—Apparatus wanted to discharge coal barges by steam shovel instead of hand shoveling. R. C. Hebener, 24 Exchange Place, Boston, Mass.

The greatest attraction at the last Am. Inst. Fair was the Cider Press of Messrs. Boomer & Baschett, where it was in daily operation. New York Office, 15 Park Row.

For Sale.—A Valuable Patent Invoice File and Holder, including dies and formers necessary for the manufacture of same. Sample file, 50 cts. Terms and circulars free. Moore, Patterson & Co., Saltsburg, Pa.

Wanted—State and County Agents to introduce a New and Valuable Patent. Address, with references, Box 43, Lake Forest, Ill.

Send to John D. Leveridge, 3 Cortlandt St., New York, for illustrated catalogue, mailed free, of all kinds of Scroll Saws and Supplies, Electric Lighters, Tyson's Steam Engines, Telephones, Novelties, etc.

Wanted—Second-hand Iron Planer, 6 foot bed, plane 16 to 24 in. wide. Must be in best order. Give maker's name, weight, and price. Moseley & Co., Elgin, Ill.

Wanted—An experienced Mechanical Engineer as Superintendent. One well known to the trade and competent to estimate. Give reference, and address Atlantic Steam Engine Works, Brooklyn, N. Y.

Wanted—Second-hand Root Blower. S. Moulson, Rochester, N. Y.

American Inventions Wanted to Sell Abroad. Address J. R. Fox, 50 St. Aubyn St., Davenport, England.

Why risk boiler explosion from mud? It can be avoided, at nominal cost, by Hotchkiss' Mechanical Boiler Cleaner, 84 John St., N. Y. Engineers make ten per cent selling other parties than employers. Send for circular.

Saunders' Pipe Cutting and Threading Machines. See adv., p. 45.

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

List 25.—Descriptive of over 2,000 new and second-hand machines, now ready for distribution. Send stamp for same. Forsaith & Co., Manchester, N. H.

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

Two Patents for sale. R. Munroe, Fitchburg, Mass.

Within the last ten years greater improvements have been made in mowing machines than any other agricultural implement. It is universally acknowledged that the Eureka Mower Co., of Towanda, Pa., are making the best mower now in use, and every farmer should write to the manufacturers for catalogue, with prices.

Eureka Vegetable Boiler Scale Eradicator, strictly vegetable, and perfectly harmless to iron. Warranted to remove scale of any thickness, and to prevent scaling from either fresh or salt water use. Circulars and particulars of G. E. Brinckerhoff, 107 Liberty St., N. Y.

For Machinists' Tools, see Whitcomb's adv., page 28

Jenkins' Patent Valves and Packing "The Standard." Jenkins Bros., Proprietors, 11 Dey St., New York.

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

Superior Malleable Castings at moderate rates of Richard P. Pim, Wilmington, Del.

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

The "1880" Lace Cutter by mail for 50 cts.; discount to the trade. Sterling Elliott, 262 Dover St., Boston, Mass.

The Tools, Fixtures, and Patterns of the Taunton Foundry and Machine Company for sale, by the George Place Machinery Agency, 121 Chambers St., New York.

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

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

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

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

Recipes and Information on all Industrial Processes. Park Benjamin's Expert Office, 50 Astor House, N. Y.

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

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

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

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

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

Downer's Cleaning and Polishing Oil for bright metals, is the oldest and best in the market. Highly recommended by the New York, Boston, and other Fire Departments throughout the country. For quickness of cleaning and luster produced it has no equal. Sample five gallon can sent C. O. D. for $8. A. H. Downer, 17 Peck Slip, New York.

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

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

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

Lightning Screw Plates and Labor-saving Tools, p. 60.

4 to 40 H P. Steam Engines. See adv. p. 45.

National Institute of Steam and Mechanical Engineering, Bridgeport, Conn. Blast Furnace Construction and Management. The metallurgy of iron and steel. Practical Instruction in Steam Engineering, and a good situation when competent. Send for pamphlet.

Eclipse Portable Engine. See illustrated adv., p. 30.

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

Clark Rubber Wheels adv. See page 29.

Reed's Sectional Covering for steam surfaces; any one can apply it; can be removed and replaced without injury. J. A. Locke, & Son, 32 Cortlandt St., N. Y.

Silent Injector, Blower, and Exhauster. See adv. p. 60.

The American Electric Co., Proprietors and Manufacturers of the Thomas Houston System of Electric Lighting of the Arc Style. See illus. adv., page 61.

Rollstone Mac. Co.'s Wood Working Mach'y ad. p. 29.

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

See Bentel, Margedant & Co.'s adv., page 60.

Tyson Vase Engine, small motor, 1-33 H. P.; efficient and non-explosive; price $50. See illus. adv., page 60.

Use Vacuum Oil Co.'s Lubricating Oil, Rochester, N.Y.

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

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

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.

Frank's Wood Working Mach'y. See illus. adv., p. 60.

Peerless Colors—For coloring mortar. French, Richards & Co., 410 Callowhill St., Philadelphia, Pa,

Peck's Patent Drop Press. See adv., page 45.

For Pat. Safety Elevators, Hoisting Engines. Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 60.

For Separators, Farm & Vertical Engines, see adv. p. 61.

Tight and Slack Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 61.

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

For Patent Shapers and Planers, see ills. adv. p. 60.

For Heavy Punches, etc., see illustrated advertisement of Hilles & Jones, on page 61.

Comb'd Punch & Shears; Universal Lathe Chucks. Lambertville Iron Works, Lambertville, N. J. See ad. p. 60.

Blake "Lion and Eagle" Imp'd Crusher. See p. 45.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 60.

Wren's Patent Grate Bar. See adv. page 45.

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

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.

Penfield (Pulley) Blocks, Lockport, N.Y. See ad. p. 61.

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.

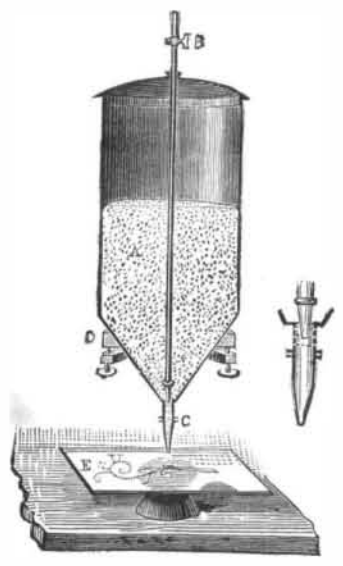
Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

(1) W. C. L. asks: Will a combination of coal gas and air confined in a chamber explode if exposed to heat? A. We have not heard of any instance of such an explosion having taken place without contact with a flame.

(2) W. W. G. asks: What is the scientific reason for the fact that the moons of Jupiter may be seen by reflecting his image in a common looking glass or mirror held horizontally, that is, the moons may be seen reflected in the glass? A. What are imagined to be the moons visible under such circumstances are not so in reality, but only a reduplicating of the body of the planet itself. The following are the optical principles involved in the formation of these false satellites: When the light from a luminous body falls upon a mirror held as described, two primary reflections reach the eye of the spectator, one from the first surface of the glass, the other from the back or silvered surface, which is much brighter than that from the outer surface. But this is not all. When the rays from the silvered side were being transmitted to the eye, part of them, when encountering the upper surface of the glass, were stopped, reflected back to the mirrored surface, to be again sent forward to the eye from a point different from those at which the two previous, or primary, reflections were made. The thicker the plate of glass the greater will be the separation of those images. This phenomenon may very easily be seen and studied by holding a plain piece of glass up on a level with the face, watching in it the reflected image of the flame from the gas or a lamp, when, if the glass is properly held, from four to eight or ten of these supplementary reflected images will readily be seen. This is usually designated "multiple reflection."

(3) C. H. B. inquires: What acid or other liquid will destroy or decompose any kind of wood with the greatest rapidity? A. Wood is chemically composed of two parts, lignin and cellulose. The walls of the vegetable cells are formed of the former; the filling matter of such cells by the latter. Lignin may be separated from wood in a pure state by boiling sawdust successively in alcohol, water, weak potash solution, dilute muriatic acid, and, finally, water. Lignin is not soluble in water, alcohol, ether, or oils; it is, however, soluble in strong nitric acid, which, on the other hand, has no action on the other constituent of wood, the cellulose, which is readily soluble in sulphuric acid, and by which it is converted into a substance similar to dextrine. From this the inference will at once be drawn that a solvent of wood must be composed of both acids. Whether these had better be employed in succession or mixed together in the form of nitrosulphuric acid, one or two experiments will determine, such experiments to be made on sawdust of any special kind of wood that our correspondent may have in his mind when putting the query.

(4) R. G. and others ask how to construct a simple and inexpensive sand blast apparatus for engraving glass and hard metals. A. Well dried sand, contained in the cylindrical vessel, A, is allowed to flow in a continuous manner through the tube, C, whose length and inclination can be altered at will, so as to regulate the fall of the sand. The tube conveying the current of air or steam terminates just above this spout, in a nozzle containing a series of fine holes. The sand, urged on by the jet, is thrown violently against the



glass plate, E, or other body placed within its range, and thus exerts an abrading action. By varying the quantity of the sand, the volume and the velocity of the current, as well as the diameter of the jet, more or less rapid effects are produced. Holes may be drilled in glass and in substances much harder than glass by means of this apparatus. In engraving on glass very little pressure is needed, the current from the bellows of an enameler's lamp being quite sufficient. In this way the divisions on graduated tubes, the labels on bottles, etc., can easily be engraved in laboratories with but little trouble. The portions of the glass which are to remain clear are covered with paper, or with an elastic varnish, these substances being sufficient protection against the abrading action of the sand.

(5) J. F. asks how to remove the hard burnt oil off the cylinder head of a steam engine. A. Try a small quantity of a strong solution of caustic potash in alcohol.

(6) W. H. W. asks if the oil that is caught by the cups under the hangers or journals can be used again. A. It should not be used again without purification. According to Simm's process the waste oil is dissolved out from the impurities by bisulphide of carbon filtered, and the bisulphide distilled off in a retort jacketed with hot water or steam, condensed and collected so that it may be used again for a similar purpose.

(7) H. C. G. asks how to color violins a dark cherry similar to the Cremonas, and how to prepare the stain and shellac. A. Stain—Dragon's blood 2 ounces, spirits of wine 1 quart. Digest with occasional agitation until dissolved. Varnish—Coarsely powdered gum copal and glass, each 4 oz.; alcohol, 1 pint; camphor, ½ oz.; heat the mixture with frequent stirring in a water bath so that the bubbles may be counted as they rise, until solution is complete, and when cold decant the clear portion.

(8) T. P. writes: In glazing sash, when the glass is crooked or convexed, which is the proper side to place next to the wood, the convex or concave side? A. The concave side, for the simple reason that the convex side gives the window a better appearance when placed outward.

(9) P. M. H. writes: I have a cast iron kettle that is cracked: how can I repair the damage? A. Sulphur, 2 parts; blacklead (plumbago), 1 part; melt the sulphur in an old iron pot over the fire, then add the blacklead, stir well together, and pour out on an iron plate or smooth stone. Apply with a hot iron after the manner of tinsmith's soldering.

(10) F. D. M. asks. Will water expand or contract in freezing? Will a water pipe burst when it freezes or when it begins to thaw out? A. Water contracts on cooling, but in congealing it expands. The rupture of water pipes is caused by the change of the water from the liquid to the solid state—not by the thawing, though it is only then that the damage to the pipe becomes apparent. Consult Tyndal's "Heat as a Mode of Motion."

(11) A. F. T. asks how to make jet black writing ink. A. Blue galls, 4½ oz; bruised cloves, 1 drachm; cold water, 40 oz; pure sulphate of iron, 1½ oz.; pure sulphuric acid, 35 minims; sulphate of indigo in the form of a thin paste, and which should be neutral or nearly so, ¼ oz.; pure water, about 1 quart. Boil the galls gently in 1½ pint of water for an hour, adding water for what is lost by evaporation. Strain and squeeze the galls (in a press). Cool, filter, and add the iron salt dissolved in water and filtered; add the acid, agitate briskly, then add the indigo, shake, and filter. Improves by age.

(12) C. H. S. asks: What are the ingredients of the lightning stove polish sold by men on the streets? It is rubbed on with a cloth, requires no brushing, and gives a bright luster. A. Pure graphite, or plumbago, reduced to an impalpable powder by grinding and bolting.

(13) G. H. C. asks: What preparation (weighing much less than paint) will effectually waterproof a canvas canoe? A. Try paraffine mixed with ½ its weight of boiled oil. Melt by heat or dissolve in benzole.

(14) A. J. S. asks: Is there any air in pure water? If so, in what proportion; or how much to the gallon? A. All natural waters hold air in solution. The quantity is usually small and very variable.

(15) J. D. S. asks: 1. Can you inform me if there is to be had a mineral (or other) powder which will answer the following requirements, namely: Color a bright full yellow; insolubility in hot or cold water or sugar solution; an impalpably fine state of division as is seen in the best German ultramarine; not poisonous unless taken in quantities over ten grains? A. Reduce the deepest yellow glass, pure crown, free from lead, the color of which is due to silver, to impalpable powder by milling. Then pass it through a silk sieve. 2. Is there any way of preparing a cement of rubber or other gum which I could use to firmly attach two pieces of leather without impairing its pliability? It must be entirely waterproof and strong. A. See p. 2510, No. 158, SCIENTIFIC AMERICAN SUPPLEMENT.

(16) J. L. S. asks (1) for a receipt for a varnish or paste, or solution, by which to cover or saturate woolen felting to make it waterproof (against warm water) and at the same time remain pliable. A. *a.* Dissolve 1 part of pure gum rubber (caoutchouc) cut in shreds in about 20 parts of bisulphide of carbon free from dissolved sulphur. Pass the felting, first thoroughly dried, through this, then expose to the air until the smell of the solvent has disappeared. Do not use the solvent too strong—dilute with bisulphide. *b.* Paraffine, 10 parts; boiled oil, 2 parts; benzole (pure), 40 parts. Apply as above. 2. Also a receipt for a cement for cementing felting together. A. See marine glue—p. 2510, No. 158, SCIENTIFIC AMERICAN SUPPLEMENT.

(17) W. T. asks (1) how to prepare the silver solution in electro-silver-plating. A. Pure nitrate, 2½ ounces; cyanide of potassium (pure), 4¼ ounces; water, 1 gallon. Dissolve the cyanide in a portion of the water and the silver nitrate in another, mix well together until clear. 2. Is one cell of gravity battery sufficient for silver-plating small articles, such as spoons, forks, etc.? A. Hardly. The exposed surface of zinc should about equal the surface of the work in the bath.

(18) J. H. V. & Co. ask: Can you inform us of any solder with which we can mend small cast iron (2 oz.) castings with a heat that will melt hard solder? We find, by using common solder, the muriatic acid in a short time rusts under and lets the solder loose. A. Silver solder will answer your purpose, providing the fracture is clean and fresh. Paint the adjoining surfaces sparingly with borax ground to a fine cream on a slate or slab. Clamp or wire the joint firmly, and apply the silver solder in small pieces around the casting on the joint, sticking them with the borax cream. Heat in a charcoal fire or blow-pipe flame until the solder flows. If soft solder has been previously applied to the casting it cannot be soldered with silver solder. See soldering in SUPPLEMENT, No. 20.

(19) F. P. C. asks: 1. What is the best preparation to use on a stove pipe, to keep it from rusting? Something not very expensive, although durable, yet will not cause the pipe to burn out. A. Apply pure graphite (plumbago) ground to a very fine powder and mixed with a little water, then rub over with some of the same, dry. 2. Which is the best foot and power lathe, and where made—all things considered—for range of work, light running, moderate cost, durability, accuracy in the work without dead centers, something suitable for ordinary workshop or amateur varied work; screw cutting included? A. See our advertising columns, also "Hints to Correspondents." 3 Will pure virgin India-rubber, dissolved in about 8 or 10 times its own weight in benzole, do to mend boots? If serviceable, how should it be used? Should it be applied as varnish over the worn or damaged parts, or put under pressure with a suitable size to cover the defect or damaged part? And if pasted or cemented on under pressure, will it be serviceable? A. Yes; patch and put under moderate pressure until dry. 4. How are uppers on leather boots and shoes mended without using thread, etc.? Can a piece of leather, of suitable size, be pasted or cemented over the defective parts on the body of the boot or shoe, making a neat mend and also serviceable? A. See marine glue (second receipt), p. 2510, SCIENTIFIC AMERICAN SUPPLEMENT, No. 158; also rubber cement, same page.

(20) E. E. S. asks how to plate small articles of steel and brass with gold, silver, and nickel, without a battery. A. Gilding by dipping: Distilled water, 17 pints; pyrophosphate of potassa or soda, 28 ounces; solution of hydrocyanic acid (⅛ pure acid), ⅛ ounce; terchloride of gold, ⅜ ounce. Put 16 pints of the water in a porcelain or porcelain-lined iron vessel, and gradually stir in the pyrophosphate, heat, filter, and let it cool down. Add the gold chloride dissolved in water, and then the hydrocyanic acid. Heat the bath nearly to the boiling point for use. (Hydrocyanic acid, it must be remembered, is very poisonous, and it must be handled accordingly.) When heated the liquid becomes colorless. If a red or violet is developed, add a few drops more hydrocyanic acid. Clean the articles thor-

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oughly; dip them in a strong aqueous solution of mercurous nitrate, then. for a few seconds, in the hot gold bath, rinse in clear water, dry in warm sawdust, and burnish if desired. Silvering by dipping: To a saturated aqueous solution of bisulphite of soda in pure water add solution of nitrate of silver, with constant stirring, until the precipitate at first formed ceases to redissolve. Use the bath cold in a porcelain enameled iron vessel. Clean and dip as in the gold bath. We know of no satisfactory method of coating with nickel without a battery.

(21) R. M. asks for a receipt for making a gold and silver wash suitable for small brass articles. A. See answer to E. E. S., above.

(22) I. A. B. wants to know the cheapest and best deodorizer or deodorizing process for kerosene or petroleum. A. Hydrocarbon derivatives of petroleum —such as kerosene—possess a characteristic odor which cannot be totally removed without altering the identity of the substance. The unpleasant odor imparted to it by impurities which it commonly contains may be removed by the following treatment: Agitate it briskly with three per cent of oil of vitriol, wash out the acid with water; digest, with frequent agitation, for several hours with 5 per cent of clean, fresh chloride of lime. settle and wash out with water. Remove moisture by agitating with powdered chloride of calcium. Settle and decant.

(23) L. D. M. asks whether there is any law against turning out or filing off one side of United States gold and silver coins to make bangles of them, or against melting coins for the sake of the gold or silver. A. Section 5459 Revised Statutes, reads: "Every person who fraudulently, by any art, way, or means, defaces, mutilates, impairs, diminishes, falsifies, scales, or lightens the gold or silver coins which have been or which may hereafter be coined at the mints of the United States, or any foreign gold or silver coins which are by law made current or are in actual use and circulation as money within the United States, shall be imprisoned not more than two years and fined not more than two thousand dollars." We think this law prohibits the defacement of coins as in making bangles. We do not know of any provision that prohibits the melting of coins for the sake of the gold or silver.

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

Dr. G. H. P.—It is quartz rock.—J. T. C. and O. L.—A fair quality of fire clay. See column of Business and Personal for the addresses of dealers.—J. T. S.—A poor quality of peat.—O. A. P. T.—The ore consists chiefly of carbonate and sulphide of copper—it carries a small quantity of silver.—F. G. D.—A semi-decomposed feldspathic rock, with a little quartz and talc.—D. Mc. G.—Coal shale—of no commercial value.—P. M. C.—Limestone—of no value to lithographers.—J. G.—Hematite—an iron ore.—W. St. J.—The rock is a common mica and talcose schist—not the "tin bloom" of miners. It would hardly pay to dig deeper.—C. H. G.—The crystals are smoky quartz—of very little economic value.—H. S.—Chiefly carbonate of lime—not valuable. —G. J. G.—Quartz pebbles.—J. F. S.—Ferromanganese—iron and manganese oxides.—H. T. C.—It is a fair quality of carbon black. If properly packed might command a market here.

NEW BOOKS AND PUBLICATIONS.

CHICAGO FIELD, 155 and 157 Dearborn street, Chicago, Ill. Dr. N. Rowe editor. An illustrated weekly devoted to field sports. Price $4 per year.

This journal, under the editorship of Dr. Rowe, has taken a foremost position among papers devoted to sport and sporting. It is well edited, and each week contains articles of much valuable information for lovers of dogs and horses. It is the only illustrated paper published in this country devoted to sports of the field, and is well worth its subscription price to those who are fond of out-door sports.

WAR SHIPS AND NAVIES OF THE WORLD. By Chief Engineer J. W. King. Boston: A. Williams & Co. 1880. 8vo, cloth, pp. 623. Sixty-six pages of engravings.

Mr. King has had exceptional facilities for making a thorough study of the naval progress of Europe during recent years, and has brought to the task a degree of practical experience and insight quite as exceptional. He entered the United States Navy when the steam marine was in its infancy, and served in the first paddle wheel frigate, the first screw war ship, indeed in all the pioneer naval steamers with the single exception of the Fulton. He has been Government Inspector of ocean mail steamers, and Chief Engineer of the New York Navy Yard. He was Chief Engineer of the North Atlantic fleet in the early part of the civil war, and subsequently was superintendent of the construction of all the armor clads built west of the Alleghanies. More recently he has been chief of the Bureau of Engineering. Most of the information embodied in the present work was gathered during several tours of observation abroad under orders from the government of the United States, made for the purpose of studying recent progress in naval architecture and the mechanical appliances for use in naval warfare. The result is a comprehensive treatise containing a vast range of fresh information touching the construction, motive power, and armament of modern warships, naval artillery, marine engines, torpedoes, and torpedo boats etc. The navies of all the naval powers are separately described, dwelling especially upon the changes in types of war ships, and in armor and armament made during the past decade. Much information is also given with regard to naval dock yards, methods of contracting for ships and machinery, naval administration, the personnel of navies, naval expenditures, and related matters. Extremely valuable also are the chapters on recent progress and improvements in artillery construction, the different systems of great guns, gun trials; armor plates and war ship materials and tests of them; the different systems of marine engines and boilers; steam and hydraulic stearing gear; torpedo explosives, torpedo warfare, and the like. The author's wide experience as an engineer has admirably fitted him for this part of his task. Though treating of difficult subjects he has successfully endeavored to set down the information given in a manner so clear that the non-technical reader will be easily able to follow him. The volume is particularly timely at this juncture, when the great problems of restoring our commercial and naval marine, and of providing for the defense of our coasts, are attracting the attention of our legislators and citizens.

CHRISTMAS BOOKS. By Charles Dickens. New York: I. K. Funk & Co. 2 vols. 8vo, paper. Each 25 cents.

A Christmas Carol, The Chimes, The Cricket on the Hearth, The Battle of Life, and the Haunted Man, with sixteen full page illustrations, printed on clear type, are here given for fifty cents. The books comprise Nos. 48 and 49 of the standard series, the excellent quality and extreme cheapness of which we have several times taken occasion to speak.

JOSH BILLINGS' COOK BOOK. New York: G. W. Carleton & Co.

A cent's worth of proverbial philosophy badly spelled, some poor engravings, and a few burlesque recipes as destitute of wit as they are of resemblance to English speech.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

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

December 28, 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.

Addressing machine, F. A. Darling ... 236,001
Amalgamator, W. D. Smith ... 236,100
Angle shears, W. & C. Sellers ... 235,908
Assay furnace, W. E. Judson ... 236,037
Axle boxes, oil guard for car, J. G. Tiller ... 235,917
Axle, car, J. M. Sigourney ... 236,097
Axles, machine for machining, F. D. Bliss ... 235,929
Bale tie, T. A. Weber ... 236,128
Bale tie, J. White ... 235,973
Bandage, W. E. Hull ... 236,033
Barrel, metal lined wooden, J. L. Barlow ... 235,980
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Barrel machinery, E. & B. Holmes, Buffalo, N. Y.
Cartridge belt fabric, A. Mills, Washington, D. C.
Castrating horses, G. L. Matthews, New York city.
Coal elevator, G. W. Wood, Faribault, Minn.
Condenser surface, I. R. Blumenberg, Washington, D. C.
Dynamo-elec. tel, O. Lugo, New York city.
Gold, extraction of, O. Bailey, White Cloud, Kan.
Linch pins, W. Gardner, Hartford, Conn.
Mining apparatus, O. S. Preshrey, Port Henry, N. Y.
Saccharine matter, extraction of, B. Odio *et al.*, N. Y. city.
Safety valve, G. W. Copeland, Boston, Mass.
Submarine vessels and guns, J. Ericsson, New York city.
Tobacco, manufacture of, J. Lindsley, Pawtucket, R. I.
Wood turning machinery (2), F. Hanson, Hollis, Me.

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