

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.

Dish Washing Machine wanted one that is capable of washing 25,000 daily. A liberal offer will be made any party possessing such a machine, by addressing D. W. M., Box 773, New York city.

Hotchkiss Improved Mechanical Boiler Cleaner. Removes all sediment from steam boilers, preventing incrustation. Send for circular J. F. Hotchkiss, 34 John St., N. Y.

Books relating to Civil Engineering, Electricity, Electric Light, Gas, Heat, Hydraulics, Mining, Sanitary Engineering, Steam Engine, Turning etc. Catalogues free. E. & F. N. Spon, 446 Broome St., New York.

The classic moralist bids "Festina Lente," but when you want a good pen, you cannot get one of Esterbrook's too quickly.

A 4 1/2 in. 2 Jaw Chuck, Independent or Universal, for Brass Finishers. Address A. F. Cushman, Hartford, Ct. For Yale Mills and Engines, see page 109.

A. Young, Houston, Texas. Lumber and Mill Supplies. Intimate relations with thirty mills and one hundred yards. Articles of merit in machinery or builders' ware introduced.

Lightning Screw Plates and Labor-saving Tools, p. 108.

Glass Window Blind Slats.—This new invention, which consists in making the slats of glass, in different colors, is made by the Corning Glass Window Blind Company, of Corning, N. Y. These glass window blinds are not expensive, are a house decoration, elegant in appearance, and are an ornament to any apartment. Nothing equals them for convenience, usefulness, and beauty. The colored blinds effectually protect costly upholstery or delicate colors of tapestry from injury by sunlight. They give sufficient light for dining-rooms, and exclude flies.

A Man, with twenty years' experience in the Foundry and Machine business, wants something to do. Address F. J. Masten, Toledo, O.

Planers to face 2 x 4 inches; price \$18. Box 170, Montclair, N. J.

For Sale.—No. 1 14 inch 6 roll 4 side (Schenck) Planer and Matcher. All late improvements, and never used. Also second-hand, 8 inch, 4 side (Huntington) Moulder, and 70 horse Upright Engine. Send for list of second-hand machinery in stock. Belcher & Bagnall, 40 Cortlandt St., New York.

Superintendent wanted, well skilled in use of wood-working machinery. Address Skill, Box 773, New York.

Rules for Engineers and Firemen, and the Removal of Scale in Boilers. Send for circular. Rankin & Co., 50 Federal St., Boston.

Alden Ore Crushers and Pulverizers, six sizes, \$45 to \$1,500. E. T. Copeland, 30 Cortlandt St., N. Y. city.

Saw Mill Machinery. Stearns Mfg. Co. See p. 77. See Stockwell Screw and Machine Co.'s adv., p. 76.

For Best Quality Brass and Composition Castings, address E. Stebbins Mfg. Co., Brightwood, Mass.

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

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

Corrugated Wrought Iron for Tires on Traction Engines, etc. Sole m'frs., H. Lloyd, Son & Co., Pittsbg, Pa. Malleable and Gray Iron Castings, all descriptions, by Erie Malleable Iron Company, limited, Erie, Pa.

Apply to J. H. Blaisdell for all kinds of Wood and Iron Working Machinery. 107 Liberty St., New York. Send for illustrated catalogue.

Our new Stylographic Pen (just patented), having the duplex interchangeable joint section, is the very latest improvement. The Stylographic Pen Co., Room 13, 169 Broadway, N. Y.

Advertising of all kinds in all American Newspapers. Special lists free. Address E. N. Freshman & Bros., Cincinnati, O.

Skinner & Wood, Erie, Pa., Portable and Stationary Engines, are full of orders, and withdraw their illustrated advertisement. Send for their new circulars.

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

Power, Foot, and Hand Presses for Metal Workers. Lowest prices. Peerless Punch & Shear Co., 52 Dey St., N. Y. Peck's Patent Drop Press. See adv., page 76.

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

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

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

National Steel Tube Cleaner for boiler tubes. A just-able, durable. Chalmers-Spence Co., 40 John St., 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.

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

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.

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

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.

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

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

Special Wood-Working Machinery of every variety. Levi Houston, Montgomery, Pa. See ad. page 77

Blake "Lion and Eagle" Imp'd Crusher. See p. 97

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 93.

For Separators, Farm & Vertical Engines, see adv. p. 93.

For Patent Shapers and Planers, see illus. adv. p. 93.

For Mill Mach'y & Mill Furnishing, see illus. adv. p. 93.

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

Rollston Mac. Co.' Wood Working Mach'y ad. p. 93.

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

Silent Injector, Blower, and Exhauster. See adv. p. 110.

Steam Engines, Boilers, Portable Railroads, Sugar Mills. Atlantic Steam Engine Works, Brooklyn, N. Y.

For Alcott's Improved Turbine, see adv. p. 110.

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.

Brass & Copper in sheets, wire & blanks. See ad. p. 108.

Air Compressors. Clayton Stm. Pump W'ks, Bklyn, N. Y.

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

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

For Superior Steam Heat. Appar., see adv., page 109.

Eagle Anvils, 10 cents per pound. Fully warranted.

Millstone Dressing Machine. See adv., page 110.

Gear Wheels for Models (list free); experimental and model work, dies and punches, metal cutting, manufacturing, etc. D. Gilbert & Son, 212 Chester St., Phila., Pa.

Walrus and Sea Lion Leather for Silver and all Metal Polishing. Greene, Tweed & Co., 118 Chambers St., N. Y.

For Shafts, Pulleys, or Hangers, call and see stock kept at 79 Liberty St., N. Y. Wm. Sellers & Co.

The best Truss ever used. Send for descriptive circular to N. Y. Elastic Truss Co., 683 Broadway, New York.

Comb'd Punch & Shears; Universal Lathe Chucks. Lambertville Iron Works, Lambertville, N. J. See ad. p. 78.

Wheels and Pinions, heavy and light, remarkably strong and durable. Especially suited for sugar mills and similar work. Circulars on application. Pittsburg Steel Casting Company, Pittsburg, Pa.

New Economizer Portable Engine. See illus. adv. p. 109.

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

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

Ore Breaker, Crusher, and Pulverizer. Smaller sizes run by horse power. See p. 109. Totten & Co., Pittsburg.

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) S. E. S. writes: I have a rowboat made of 1/4 inch cedar, which I wish to make watertight. I thought of two ways: 1. To cover the outside with 1/2 inch boards and fasten with copper rivets; or 2. To cover with canvas, using some cement or glue. Which do you think is best, or do you know of a better method? I have tried calking, but it does no good. A. Use canvas, well painted.

(2) A. F. N. asks: 1. What length of stroke and diameter of cylinder will be necessary to run a boat 18 feet long by 5 feet beam torun at a fair speed in still water? A. 3 inch cylinder by 4 inches stroke. 2. Where can I obtain rough castings for above engine? A. We do not know of any one having them in stock. 3. Can I use lap welded boiler tube for boiler? also, what diameter and length and number of flues? A. Yes; you should have 70 to 75 feet fire surface. 4. Which will be best, paddle wheels or screw? A. Screw.

(3) J. W. R. writes: 1. I have a boiler 8 feet long, 14 inches in diameter, with a return flue 6 inches. I want to know what is the heating surface. A. 26 feet. 2. My cylinder engine is 5 inches stroke, 3 inches bore; what is the horse power at 50 lb. steam, at 250 revolutions per minute? A. A little over 2 horse power.

(4) W. S. F. asks: Will an ordinary two inch spy glass objective do for a photographic camera? A. It might answer a purpose if the focus is not too long. However, a regular camera combination is better.

(5) W. E. asks (1) where to obtain statistics and plans for steam launches (engines, etc.) from 20 to 40 feet in length; their speeds and running expense. A. We know of no statistics or data respecting the performance of steam launches more full than you will find in the SCIENTIFIC AMERICAN SUPPLEMENTS.

2. Please tell me if the license for launch engineers has been changed. A. The fee has not been changed.

(6) G. T. C. writes: We are using a solution here which has to be raised to a height of 20 feet, and it is almost impossible to get any kind of a pump to stand it, not even a rubber one. Is a little heavier than water. Would it be possible to make a wooden tank strong enough to raise the solution by air pressure? If it would, about what thickness of material would be required? Could we use an air blower, or would it require an air pump to get the required pressure? A. A centrifugal pump of either iron or brass might suit your purpose, unless the material you pump will attack the metal. It would be possible to construct a wood vessel and use compressed air. You would require an air compressing pump a blower would not do. Could you not use a steam ejector?

(7) A. K. D. asks: Will a brick smokestack 55 feet high be sufficient height for a sixty horse steam boiler to produce the best results in raising steam, and what size hole should there be in the stack, and should it be smaller at the top than bottom? A. Make your chimney not less than 60 feet high and flue 28 inches or 30 inches square, and parallel the whole height.

(8) H. B. asks: 1. What size flywheel should I use for engine with 6 inch cylinder by 2 1/2 diameter? A. 16 to 18 inches. 2. Can you give me any information on melting zinc? I have melted some, but it will not run solid. Is there any mixture I could put with it to make it run solid, and would it do for steam engine cylinder of the size above mentioned? A. You had better use block tin or brass for your cylinder. 3. Would block iron 1/2 inch in thickness be strong enough to make boiler for cylinder mentioned, boiler to be 3 feet high and 1 foot 6 inches diameter. Would boiler be large enough? A. Would recommend three-sixteenths inch thick. Make boiler at least 20 inches diameter and 4 feet high.

(9) S. S. J. writes: In fitting key to cross-head and piston rod with usual taper, should it bear equally on each side, or should some be cut away to give draught? A. The sides of key should be parallel and a good easy fit. The draught to be on the edges and keyways cut away so that the rod will draw home.

(10) D. D. H. asks for the best method of putting in a non-conductor of heat between an iron roof and wooden ceiling. Will building paper answer the purpose? if so, how should it be used? A. The best method would be to give free circulation to the air between the roof and ceiling, then the heat from the roof would be carried away by the air.

(11) A. J. S. asks: Is there any way to keep the bright work, "hot bright work," such as ends and valve box of the Corliss engine, clean? A. A mixture of white lead and tallow, put on with a brush will keep the surfaces from rusting, but the cleaning must be done by hand.

(12) J. J. S. asks for some information relative to the source and method of preparation, etc., of what is known as a "snood," an article used by fishermen for attaching hooks to fishing lines. A. It is silk worm gut. The best comes from Spain. We believe it to be the contents of the silkworm's sac drawn out in bulk just as it is ready to spin its cocoon.

(13) D. H. F. asks: 1. What is the best material to make buttons of to prevent rusting on an electric switch that must necessarily be exposed to the weather? A. Copper. 2. Suppose I use a double electro-magnet with a permanently magnetized armature; the armature is attracted when the current passes. Reverse the current, thereby reversing the poles, will the armature be repulsed, and with what proportionate force? A. It will be repelled; the force will depend on the size of the armature and the amount of magnetism in it.

(14) F. D. H. asks: What is the "hall mark," spoken of in connection with London plate and jewelry? Of what does it consist, and what was its origin? A. Hall mark—the official stamp of the British Goldsmiths' Company and other authorized assay offices on gold and silver articles to guarantee their purity. The standard silver of England is an alloy, containing, in 1,000 parts, 925 parts silver and 75 copper. Originally the Goldsmiths' Company had a monopoly of gold and silver work in England. The company is still authorized to search the shops of silversmiths and seize articles which do not bear the hall mark of the company. A charge of 1s. 6d. an ounce is made for assaying and stamping, the larger portion of the revenue so derived being paid over to the government.

(15) J. H. T. writes: In SUPPLEMENT No. 225, p. 3589, under "Farming in Southwestern Minnesota" it is stated that: "Throughout these Western States lands are frequently pointed out as belonging to Englishmen, who to counterbalance the depreciation unfortunately going on in land property in England, are investing in desirable estates in America." Can this be true? I have always been under the impression that aliens could not hold real property in this country. Am I wrong in my impression? A. You are wrong. Different States have different laws on this point. 2. In both the SCIENTIFIC AMERICAN and SUPPLEMENT receipts frequently appear in which it is stated that so many parts of a solid and so many parts of a liquid are to be taken. By parts is it always meant parts by weight of both solid and liquid? If not, how then are such formulas to be interpreted? A. Parts by weight are intended unless otherwise specified. Fluids may often be more conveniently measured—taking the fluid ounce or liter and pure water as the standard. Their specific gravity must, however, be taken into consideration—sulphuric acid, for instance, is nearly twice as heavy as water (1.8). 3. Is it possible for a man engaged in active business, but who desires to employ such leisure time as he may have in the study of mineralogy, to obtain access to a cabinet of minerals in this city or vicinity? A. Visit "School of Mines," Columbia College, or Metropolitan Museum of Natural History, Manhattan Square, near Central Park, west side.

(16) J. G. S. writes: I am employed in a large engineering works in this country. Many of us

have had quite a discussion on the question whether it takes more power to stop a fly wheel than it does to start it. Suppose an engine of certain power could get the speed of a fly wheel up in a minute, which is 300 revolutions, if the same, applied in the opposite direction, could it stop it in the same time? A. It would be stopped in less time. In starting you have the friction operating against the power and in stopping the friction aids you.

COMMUNICATIONS RECEIVED.

On a Catamaran that will Come About. By J. B. C. On the Theory of Scientists concerning Perpetual Motion.

On Artificial Diamonds. By N. B. C.

[OFFICIAL.]

INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending July 20, 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.

Table listing various inventions and their patent numbers, including items like Air, method of and apparatus for heating, Alumina or alum, making and purifying sulphate of, W. Chadwick et al., Ammonia, manufacture of aqua, J. L. Marsh, Animal trap, J. H. Eatman, Announcer drop, electrical, E. T. Gilliland, Bale tie, J. F. McLaughlin, Baling press, J. H. Simonson, Bedstead fastening, N. P. Bradish, Bedstead, folding or cabinet, S. S. Burr, Binder for the filing and protection of papers, W. Keenan, Biscuit cutter and sticker, comb'd, I. W. Lincoln, Boiler furnace, steam, S. E. Babcock, Boiler furnace, steam, J. Wavish, Book covers, metallic guard for, G. W. Emerson, Boot and shoe, W. H. Hannaford, Boot and shoe counter stiffeners, machine for forming flanges on, H. G. Farr, Boot and shoe heeling machine, T. Cowburn, Boot and shoe soles, machine for shaping, J. B. Johnson, Bottle and stopper, ointment, R. Gordon, Box nailing machine, W. H. Brock, Brick machine, F. W. Schu, Bridge and bridge iron, A. Gottlieb, Bridges, barrier for draw, A. R. Sherman, Broom and brush holder, J. H. Rosson, Brush, M. Hendrickson, Brush, fountain, A. J. French, Buckle, H. G. Bardwell, Buckle lever, L. A. Sprague, Burglar alarm, E. Glover, Button, A. J. Shipley, Button, G. C. Thomas, Button and stud, separable, W. P. Dolloff, Button backs, machine for making, F. C. Cannon, Buttoner, glove, J. W. Partridge, Calendars, etc., back and brace for, G. Bergen, Camera attachment, Molera & Cebrian, Cans, apparatus for exhausting air from, T. G. F. Dolby, Car brake, D. R. Dwyer, Car coupling, W. H. Ward, Car coupling, P. B. Williams, Carbon conductors, manufacturing, H. S. Maxim, Carpenter's gauge, W. Goodwin, Carpet lining, Smith & Beale, Carriage bow, B. J. Warden, Carriage curtain fastening, O. M. Tuttle, Carriage dash frame, G. Monteith, Carriage lifter, C. F. Haynes, Carriage top, J. McKee, Caster, J. F. Ohmer, Catch for holding chest covers, etc., A. Montant, Centering apparatus, C. L. Wolff, Chair brace, R. J. Farum, Chisel, J. D. Baxter, Churn, C. M. Smith, Churn dasher, S. J. Linn, Cigarette machine, A. Decouffe, Clapboard machine, A. Cunningham, Clock, alarm, H. J. Davies, Clock calendar, self-adjusting, I. W. Johnson, Clock dial, geographical, C. F. Bourquin, Clock pendulums, suspension of, S. B. Jerome, Clothes prop, Meeker & Fisher, Cock, three-way, W. H. Ward, Coffee mill, F. Hickman, Coffee roaster, W. Langner, Collar, J. W. A. Cluett, Collar fastening, horse, Fisher & Watson, Columns, fireproofing iron, C. Mettam, Compass, ship's, F. Alsing, Converter bottom, T. & S. McDonald, Cooking can and dinner pail, combined, J. B. Haskell, Copper for making cast hollow cylinders and other castings, treating molten, S. Walker, Corn husker, W. B. Farwell, Corset, C. F. Allen, Cotton, device for handling and shipping, C. H. Merry, Culinary vessel, F. Schifferle, Depurator, A. Seyberlich, Diphtheria remedy, S. H. Longard, Dish handle, detachable, J. B. Timberlake, Dish heater, H. A. Sawyer, Disintegrating apparatus, A. B. Lipsey, Distilling petroleum, process and apparatus for, S. Cheney, Ditching and dredging machine, J. A. Murray, Diving bell, C. F. Pike, Door for cabinets, cases, etc., circumrotary, C. Senrick, Electric light circuits, automatic regulator for, W. Sawyer

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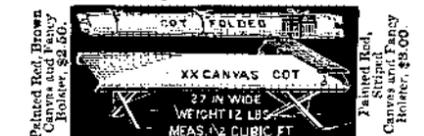
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