Business and Lersonal.

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Blake Crushers, all sizes, with all the best improvements at less than half former prices. E. S. Blake & Co., Pittsburg, Pa.

Comb'd Punch & Shears: Universal Lathe Chucks, Lambertville Iron Works, Lambertville, N. J. See ad. p. 333. To Thrashing Machine Manufacturers.-The best,

cheapest, and most durable Grain Tally. Can be at-tached to separators. Measures and registers correctly. Shop rights or entire patent for sale. Address A. H. Seavey, North Huron, Wayne Co., N. Y.

Agency Wanted to introduce some Novelty into Canada by a gentleman of ability. Address "Novelty," Aylmer, Ont.

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Hoisting Machinery of all kinds a specialty.

Castings of Crucible Steel, solid, act same as bar steel. Specialty: Cast Cast Steel Plow Shares. Agricultural Wrought Steels of every description. us. Read, McKee & Co., limited, Pittsburg, Pa.

For Sale,-Patent Automatic Planer Knife and Tool Grinder. Also Patent Friction Clutch and Pulley. Address E. S. Fernald, Saco, Me.

A Firm in Scotland, representing a New York Leather Belting House, are anxious to obtain another representation for American goods. Address B. J. H., P. O. Box 2701, New York.

Presses, and Dies that cut 500,000 fruit can tops without sharpening. Ayar Machine Works, Salem, N. J. For Sale.—One Horizontal Steam Engine, 20'' x 48''

one 18" x 42"; one 16" x 36". Atlantic Steam Engine Works, Brooklyn, N. Y.

Wood Turning Lathes. P. Pryibil, 467 W. 40th St., N.Y

tations called Phoenix. Greene, Tweed & Co., 18 Park Place, N. Y.

Box-bell, \$1 50. Bell, Battery, and Push Button, \$3. All first-class. H. Thau, 128 Fulton St., N. Y.

Situation Wanted.—Have had ten years' experience as mechanical superintendent of a large sewing machine business. Understandmechanical drawing, tool making, etc. Best of references. Particulars by letters. Address K., Box254, Guelph, Ontario, Canada.

The Genuine Asbestos Steam Pipe and Boiler Coverings are the most durable, effective, and economical of any in use. H. W. Johns Manufacturing Company, 87 Maiden Lane, New York, are the sole manufacturers.

A Gentleman, now Foreman in a large Manufactory. possessing inventive ideas, a first-class draughtsman, theoretical and practical machinist, desires to change his present position for one in which he may have a bet-ter chance to employ his skill in all kinds of scientific or industrial machinery. Address, for ten days, F. Lambert, 365 12th St., South Brooklyn, N. Y.

See Staples & Co.'s advertisement of Non-Congealable Lubricating Oils on inside page.

Metallic Articles Colored in Single or Rainbow Colors. New Process. High cost metals imitated in cheaper metals. Gardiner M'f'g Co., Newburyport, Mass.

For best Fixtures to run Sewing Machines by Power, address Jos. A. Sawyer & Son, Worcester, Mass

Thomas D. Stetson, 23 Murray St., New York, serves as Expert in Patent Suits.

The Baker Blower ventilates silver mines 2,000 feet deep. Wilbraham Bros., 2318 Frankford Ave., Phila., Pa. Wheelbarrows.-The "A. B. C. bolted " will outlast

five ordinary barrows. \$24 per doz. A. B. Cohu, 197 Water St., N. Y.

Park Benjamin's Expert Office, Box 1009, N.Y. Recipes and information on all industrial processes

To stop leaks in boiler tubes, use Quinn's Patent Ferrules. Address S. M. Co., So, Newmarket, N. H.

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.

If-Preservation, 300 nages Price, only \$1 Conta

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

Eclipse Portable Engine. See illustrated adv., p. 318.

Special Wood-Working Machinery of every variety. Levi Houston, Montgomery, Pa. See ad. page 269,

Sheet Metal Presses, Ferracute Co., Bridgeton, N. J. Latest improved methods for working hard or soft writer. metals, grinding long knives, tools, etc. Portable Chuck Jaws and Diamond Tools. Address American Twist Drill Co., Woonsocket, R. I.

For best Portable Forges and Blacksmiths' Hand Blowers, address Buffalo Forge Company, Buffalo, N. Y. Diamond Planers. J. Dickinson, 64 Nassau St., N.Y. Steam Hammers, Improved Hydraulic Jacks, and Tube

Expanders. R. Dudgeon, 24 Columbia St., New York. Sawyer's Own Book, Illustrated. Over 100 pages of valuable information. How to straighten saws, etc. Sent free by mail to any part of the world. Send your full address to Emerson, Smith & Co., Beaver Falls, Pa. Eagle Anvils, 9 cents per pound. Fully warranted.

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

Tight and Slack Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus'd adv. p. 30. Elevators, Freight and Passenger, Shafting, Pulleys. and Hangers. L. S. Graves & Son, Rochester, N. Y.

The Horton Lathe Chucks; prices reduced 30 per cent. Address The E. Horton & Son Co., Windsor Locks, Conn \$400 Vertical Engine, 30 H. P. See page 350.

No gum! No grit! No acid! Anti-Corrosive Cylinder Oil is the best in the world, and the first and only oil that perfectly lubricates a railroad loco-motive cylinder, doing it with half the quantity required of best lard or tallow, giving increased power and less wear to machinery, with entire freedom from gum, stain, or corrosion of any sort, and it is equally superior for all steam cylinders or heavy work where body or cooling qualities are indispensable. A fair trial insures its continued use. Address E. H. Kellogg, sole manufacturer, 17 Cedar St., New York.

Emery Wheels for various purposes, and Machines at reduced prices. Lehigh Valley Emery Wheel Company, Weissport, Pa.

Wood Turning Latnes. F. Fryton, 20. Light and Fine Machinery contracted for. Foot Lathe Catalogue for stamp. Chase & Woodman, Newark, N. J. Empire Gum Core Packing is reliable; beware of imi-Empire Gum Core Packing is reliable; beware of i

Magic Lanterns and Stereopticons of all prices. Views illustrating every subject for public exhibitions. Profitable business for a man with small capital. Send stamp for 80 page illustrated catalogue. McAllister, Manufacturing Optician, 49 Nassau St., New York.

Patent Steam Cranes. See illus. adv., page 351

National Steam Pump. Simple, reliable, durable. Send for catalogue. W. E. Kelly, New Brunswick, N.J.

Renshaw's Ratchet (short spindle) uses taper and square shank drills. Pratt & Whitney Co., Hartford, Ct. Electro-Bronzing on Iron. Philadelphia Smelting Company, Philadelphia, Pa.

Improved Steel Castings; stiff and durable; as soft and easily worked as wrought iron; tensile stre less than 65,000 lbs. to sq. in. Circulars free. Pittsburg Steel Casting Company, Pittsburg, Pa.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box423, Pottsville, Pa. See p. 349. Rue's New "Little Giant" Injector is much praised for its capacity, reliability, and long use without repairs. Rue Manufacturing Co., Philadelphia, Pa.

Catechism of the Locomotive, 625 pages, 250 engravings. stood book on the Locomotive. Price \$250. Send for a catalogue of railroad books. The Railroad Gazette, 73 Broadway, New York.

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.

Steam Engines, Automatic and Slide Valve; also Boil-Woodbury, Booth & Pryor, Rochester, N. Y. See rs. illustrated advertisement, page 285.

Microscopes, Optical Instrm's, etc. G. S. Woolman, 116 Fulton St., N. Y.

NEW BOOKS AND PUBLICATIONS.

VAN NOSTRAND'S SCIENCE SERIES. Numbers 45 and 46 of these reprints are respectively: Thermodynamics, by Henry T. Eddy, C.E. Ph.D., of is to bring the center of gravity as much below the water the University of Cincinnati; and Ice Making Machines, line as possible, as it seems to me that by so doing we The Secret Key to Health .- The Science of Life, or translated from the French of M. Ledoux, mining engimeraims to give a brief and log ai exposi tion of the fundamental and simplest applications of form of midship section does not determine the best cipitation from solution of its sulphate with zinc) are thermodynamics; the latter discusses theoretically the model. What you propose would probably be fastest in conditions of effective working of the three classes of ice-making machines.

profession. For such men it is likely to prove very serviceable. They will at least find no trouble in understanding what the author has to say, his language being admirably simple, direct, and free from mathematical

or scientific affectation.

anteries

HINTS TO CORRESPONDENTS.

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

Namesand 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 nel into smaller reservoirs, from which it is conducted name the date of the paper and the page, or the number of the question.

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 SUPPLE-MENT referred to in these columns may be had at this office. Price 10 cents each.

(1) O. R. writes: Your recipe on shoe dressing is very good. I find that the different ingredients give a good black liquid, which makes the leather smooth, soft, and black, but without gloss. Can you inform me how to obtain a gloss? A. Increase the percentage of shellac and ammonia.

required in a ditch to carry the water three miles an tracted to 34 inch just at the lower nozzle, the other hour, provided the ditch is straight. A. The flow of water in the ditch would depend upon the character of the soil and smoothness of the surface. 2. Could you refer me to some reliable work that treats on running contracted just at the outlet the friction will be least. water and ditching, etc.? A. "Fanning on Water Supply Engineering "is a good work.

(3) "Atlas" asks how to mount maps on cloth, and best kind of paste and fabrics for purpose. A. Stretch smooth factory cloth upon a frame and coat Machine Knives for Wood working Machinery, Book it with glue size. Before this dries, apply a strong flour paste to the back of the map and lay it smoothly on the cloth. Let it remain until perfectly dry. If the map is to be varnished, apply two or three coats of isinglass size, and after it becomes thoroughly $d r y \ flow \ on \ a$ coat of varnish consisting of balsam of fir diluted to the proper consistency with turpentine.

> (4) J. P. asks: 1. Can a current of electricity be generated by an electro-dynamic machine, without the use of either a battery or permanent magnets to charge the machine with? A. Yes; see SUPPLE-MENT, No 161. 2. What is the electromotive force of the Grenet battery when first connected? How long after it is put in action will it maintain its strength, and to what extent will the force of current decrease? A. 1.095 volt. The strength of the current diminishes quite rapidly if the battery is allowed to remain in action any considerable length of time continuously. It is not adapted for a continued use, but where a strong cur- 159. rent is required occasionally for a few minutes at a time it answers a good purpose. 3. What form of battery best combines strength of current, constancy, and economy? A. Bunsen's, or some of its modifications.

(5) E. M. C. asks: Is there an easy way of distinguishing between 8vo, 12mo, 16mo, 18mo, and other sizes of books, by those not practical printers, The most accurate, complete, and easily under- and what is it? A. Count the pages between printers signatures (letters or figures) at the foot of page

> (6) O. M. S. asks: Is a lightning rod supported upon large insulators and having no ground connection, supported by any scientific authority that you know of? A. No.

(7) J. S. B. writes: The yachts in use here, of which there are many, are built on a flat model. They are very broad beam, the beam in some cases being about 2-5 of the length, and usually light draught. They are without keels, but furnished with center boards. Now, I am thinking of building a yacht, upon a deeper and narrower model, withkeel. How will the two compare for lime in powder, moisten the mixture with soft cold New speed? And how would it do to make the keel in latter York: D. Van Nostrand. Price 50 cents. model in whole or part of iron, heavyenough so that ordinarily no other ballast will be needed? My object in this cessary. over. Would my plan have that effect? A. The mere

speed successfully, everything must be well proportioned and nicely fitted.

(10) J. F. asks: What is the best method of easily and economically sevarating in large quantities of salt water, the calcium magnesia. etc., so salt will remain pure? A. There are three methods employed for separating salt from calcium magnesia. etc.: a, by evaporation of the water by aid of the sun's heat; b, in winter by freezing; c, by artificial evaporation. The first method is generally used on the coast lines of southern Europe. The arrangement of the salines or salt gardens is as follows: On a level sea shore is constructed a large reservoir, which by a short canal communicates with the sea, care being taken to afford protection against the inroads of high tides. The depth of water in these reservoirs varies from 0.3 to 2 meters. The sea water is kept in the reservoir until the suspended matter has been deposited, and is then conveyed by a wooden chanby underground pipes to ditches surrounding the salines, where the salt is separated from the water. The salt is Correspondents whose inquiries do not appear after collected, placed in heaps on the narrow strips of land which separate the ditches from each other, and sheltered. As these heaps are left for some time, the deliquescent chlorides of magnesium and calcium are absorbed in the soil, consequently the salt is comparatively pure. If the salt water is derived from salt wells or springs, the brine is immediately boiled down. This boiling generally requires several weeks, the scum being removed and the soda and calcium sulphates deposited removed with perforated ladles. As soon as a crust of salt is formed on the surface of the liquid a temperature of 50° C is maintained. At this stage the salt is gradually deposited at the bottom of the pan in small crystals, and being removed, is put into conical willow baskets, which are hung on a wooden support over the pan to admit of the mother liqnor (which contains the greater part of the magnesium and calcium chlorides) being returned to it. Finally, the salt is dried and packed in casks.

(11) G. S. T. writes: A reservoir is 60 rods (2) H. C. asks how much fall would be i distant, descent 40 feet. One pipe of 1% inch bore con pipe of 11/2 inch bore for 20 rods, 1 inch bore for the next 20, and the last 20 rods of 3/2 bore. Which of the above will convey more water? A. In a 11/2 inch pipe

> (12) T. M. J. asks: 1. Will the water, if conveyed to the boiler in a 2 inch pipe, force itself into the boiler against a greater steam pressure than (say) in a 1/2 inch pipe? A. No. 2. In "Peck's Natural Philosophy" there is an illustration of how a cask was bursted, by filling the cask with water from the top of a tube 34 feet long. Will the heavier weight of water in a large pipe not add materially to pressure per square inch at the lower end of the pipe? A. No. 3. Could I overcome any resistance in the boiler by letting the water into the boiler through a funnel or a small hole on the principle of an injector? A. You cannot, unless you use an injector

> (13) J. R. H. asks: 1. Can exhausted steam be used to heat up a workshop? A. Yes. 2. In what way does it affect the working of an engine? A. Produces a little back pressure on the piston. 3. And what per cent of power is lost between exhausting through a pipe 20 feet long, and one 120 feet long? A. Difference is not appreciable if pipe is large.

(14) G. E. T.-You will find directions for making batteries in SUPPLEMENTS, Nos. 157, 158, and

(15) W. H. B. asks, Does the microphone strictly magnify the sound or only transmit it? A. It merely transmits it.

(16) C. K. M. asks: 1. What is the best method of magnetizing a rat tail file 15x1/2? A. Inclose the file in a helix made of about 50 feet of No. 16 insulated wire, and connect the helix with 4 or 6 cells of carbon battery. 2. Can I magnetize it with an ordinary Daniells battery, by wrapping it with insulated copper wire? A. Yes, by using 6 or 8 cells.

(17) S. G McM. asks: 1. Will a etlephone that is constructed as described in SUPPLEMENT, No. 142. work when the coil is made of No 30 wire? If not. will it with No. 32? A. No. 30 wire is too coarse. No. 32 might answer, but the results would not be satisfactory. Use No. 36. 2. What size should the connecting wire be if made of copper? A. No. 18 will do.

(18) A. S. B. asks: How can I take grease out of marble? A. Mix sal-soda with two parts of quickwater, coatthemarble with this, and letit remain twelve hours. Then wash with water and a little soap if ne-

(19) J. D. asks: How can I make an allow of copper which will attach itself to glass, metal, or porwould be able to sail closer to the wind without going celain? A 20 to 30 parts finely blended copper (made by reduction of oxide of copper with hydrogen or premade into a paste with oil of vitriol. To this add 70 parts of mercury and triturate well: then wash out the acid with boiling water and allow the compound to cool. In ten or twelve hours it becomes sufficiently hard to receive a brilliantpolish and to scratch the surface of of an engine of 61/2 inch cylinder, 14 inch stroke, 70 lb. tin or gold. When heated it becomes plastic, but does not contract on cooling. (20) A. L. C. asks why a piece of paper cannot be blown off the end of a tube if it is simply placed over the tube at one end with nothing to fasten it. A. This phenomenon occurs only when the tube has to a vacuum formed on the surface of the card by the lateral discharge of air. This subject is fully treated in an article on the ball puzzle in SUPPLEMENT, No. 51.

fifty valuable prescriptions, either one of which is worth more than ten times the price of the book. Illustrated sample sent on receipt of 6 cents for postage. Address Dr. W. H. Parker, 4 Bulfinch St., Boston, Mass.

Wright's Patent Steam Engine, with automatic cut-off. The best engine made. For prices, address William RESUME OF YELLOW FEVER. (Quarantine Wright's Patent Steam Engine, with automatic cut-and Home Sanitation.) By A. Clen Wright's Patent Steam Engine, with automatic cut-

For Solid Wrought Iron Beams, etc., see advertise. ment. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

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

Lathes and Machinery for Polishing and Buffing Metals. E. Lyon & Co., 470 Grand St., N. Y.

Steam Excavators. J. Souther & Co., 12 P.O. Sq. Boston. Bradley's cushioned helve hammers. See illus. ad. p. 302.

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

Noise-Quieting Nozzles for Locomotives and Steamboats. 50 different varieties, adapted to every class of engine. T. Shaw, 915 Ridge Avenue, Philadelphia, Pa. cialty, by E. & B. Holmes, Buffalo, N. Y.

dinen, M.D.

Abstract of report by Dr. Clendinen, as chairman of Committee of Intelligence, District Society of Bergen County, New Jersey, first printed in the Transactions of the State Medical Society. The author has brought to-Hydraulic Presses and Jacks, new and second hand. gether a good many facts in the history of yellow fever, always imported, and denies the efficacy of quarantine losses, leaves 24 horse power to prevent its occurrence when local conditions are favorable.

> A CATECHISM OF THE MARINE STEAM EN-GINE. By Emory Edwards. Illustrated. Philadelphia: Henry Carey Baird & Co. 12mo, 374 pages. Price \$2.

Offered as a practical work for practical men. espe-Stave, Barrel, Keg, and Hogshead Machinery a spe. cially for young and inexperienced engineers, mechanics, power you want. A vertical tubular boiler should have calendar; and our Alaskan islands by their taking their and firemen, who wish to adopt marine engineering as a at least 220 feet heating surface. To run at such high time from San Francisco.

deep water and strong winds, but the light draught fastest in light winds. The iron keel is good and should be heavy; do not make your cross section too full below.

(8) F. M. D. asks what is the horse power pressure, 180 revolutions. I am running an engine of

that size, there has been quite a dispute about it. One man said it was a four horse, another said 20. I think it about an 8 horse. A. If you are working 70 lb. pressure on the piston, whole stroke, the available power is which he finds well described by Hippocrates, 2,240 about 24 horse power. By actual calculation it is 32 a flange or its equivalent around the discharge opening, years ago. He does not believe that the disease is horse power, deducting 25 per cent for friction and other The adherence of the paper to the end of the tube is due horse power; deducting 25 per cent for friction and other The adherence of the paper to the end of the tube is due

> (9) "Inventor" writes: I want to connect an engine or engines to a shaft running 390 or 400 revolutions per minute; how small ought the cylinders to be to give me 8 or 9 horse power, and what size upright tubular boiler will furnish steam? Can I run the engines with success? How many engines are necessary? A. A 6 inch cylinder and 8 inch stroke will give you the

(21) A. H. asks: Where on the globe will the new year 1880 be greeted or welcomed first? A. In New Zealand most probably; possibly a little earlier at some English missionary station in Polynesia. Eastern Siberia is ruled out of the reckoning by the Russian