

Facts for the Ladies.—Mrs. M. J. Monroe, New York, has used her Wheeler & Wilson Lock-Stitch Machine since 1858 on family sewing and general manufacture; has tried others, but would rather pay \$300 for it than use any other machine; it is as good now as when bought. See the new Improvements and Woods' Lock-Stitch Ripper.

Business and Personal.

The Charge for Insertion under this head is One Dollar a Line. If the Notice exceed Four Lines, One Dollar and a Half per Line will be charged.

Goodspeed & Wyman, Winchendon, Mass., Manufacturers of Tub, Pall and Chair Machinery.

For Sale—A Patent for a Rotary Engine, one of the best ever invented. Address, by letter, to H. W. M., care F. J. Mather, 49 Wall St., N. Y.

Wanted—A Screw-cutting Engine Lathe and Chuck, to swing 48 in. and to take in about 8 to 10 ft. in length. Any one having such a Lathe for sale, cheap, can address Box 3829, New York Post Office.

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A first class pattern maker, capable of overseeing twelve or fifteen hands, may hear of a good situation by addressing Box 533, Baltimore, Md.

Gage Lathes for all kinds of handles and cabinet work. Illustrated Catalogue free. T. R. Bailey & Vail, Lockport, N. Y.

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Soluble Glass, Water Glass, Liquid Quartz, Silicates of Soda and Potash for Concrete Cements, Fire and Waterproofing, manufactured by L. & J. W. Feuchtwanger, Chemists, 55 Cedar St., New York.

Oxide of Manganese, highest test, from our own mines, for Steel manufacturing, Patent Dryer, Paints and Glass, at lowest prices, by L. & J. W. Feuchtwanger, 55 Cedar St., New York.

Nickel Salts, double Sulph. and Ammonia, especially manufactured for Nickel Plating, by L. & J. W. Feuchtwanger, Chemists, 55 Cedar St., New York.

One Iron Planer, planes 8 ft. long, 3 ft. square; \$200 worth of Tools, used 3 months. Also, 1 heavy Hand Lathe, back geared, 30 in. swing, 10 ft. bed; \$50 worth of Tools. John R. Abbe, Providence, R. I.

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Complete Water Gauge for \$4. Holland & Cody, 8 Gold St., N. Y.

Engine and Speed Lathes of superior quality, with hardened Steel bearings, just finished at the Washburn Shop, connected with the Technical Institute, Worcester, Mass.

Large and well lighted Rooms to rent, with Steam Power for manufacturing purposes. Apply to the Allen Works, cor. of Jay and Plymouth Sts., Brooklyn, between Catherine and Bridge St. Ferris.

Ransom Syphon Condenser at Fair American Institute. "Be sure and see it."

Wanted—To purchase a small Steam Tug. Address R. F. Learned, Natchez, Miss.

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I will Remove and prevent Scale in any Steam Boiler or make no charge. Engineer's Supplies. Geo. W. Lord, Philadelphia, Pa.

Absolutely the best protection against Fire—Babcock Extinguisher. F. W. Farwell, Secretary, 407 Broadway, New York.

Hydraulic Jacks and Presses—Second Hand Plug Tobacco Machinery. Address E. Lyon, 470 Grand St., New York.

Steel Castings "To Pattern," from ten pounds upward, can be forged and tempered. Address Collins & Co., No. 212 Water St., N. Y.

Gatling guns, that fire 400 shots per minute, with a range of over 1,000 yards, and which weigh only 125 pounds, are now being made at Colt's Armory, Hartford, Conn.

Machinists; Illustrated Catalogue of all kinds of small Tools and Materials sent free. Goodnow & Wightman, 23 Cornhill, Boston, Mass.

Ashcroft's Original Steam Gauge, best and cheapest in the market. Address E. H. Ashcroft, Sudbury St., Boston, Mass.

Heydrick's Traction Engine and Steam Plow, capable of ascending grades of 1 foot in 3 with perfect ease. The Patent Right for the Southern States for sale. Address W. H. Heydrick, Chestnut Hill, Phila.

The Berryman Steam Trap excels all others. The best is always the cheapest. Address I. B. Davis & Co., Hartford, Conn.

Wanted—Copper, Brass, Tea Lead, and Turnings from all parts of the United States and Canada. Duplaine & Reeves, 760 South Broad Street, Philadelphia, Pa.

The Berryman Heater and Regulator for Steam Boilers—No one using Steam Boilers can afford to be without them. I. B. Davis & Co.

T. R. Bailey & Vail, Lockport, N. Y., Manf. Gauge Lathes.

Brown's Pipe Tongs—Manufactured exclusively by Ashcroft, Sudbury St., Boston, Mass.

American Boiler Powder Co., Box 797, Pittsburgh, Pa., make the only safe, sure, and cheap remedy for "Scaly Boilers." Orders solicited.

Gear Wheels for Models. Illustrated Price List free. Also Materials of all kinds. Goodnow & Wightman, 23 Cornhill, Boston, Mass.

Windmills: Get the best. A. P. Brown & Co., 61 Park Place, N. Y.

Ashcroft's Self-Testing Steam Gauge can be tested without removing it from its position.

The Berryman Manuf. Co. make a specialty of the economy and safety in working Steam Boilers. I. B. Davis & Co., Hartford, Conn.

Williamson's Road Steamer and Steam Plow, with Rubber Tires. Address D. D. Williamson, 34 Broadway, N. Y., or Box 1809.

Belting as is Belting—Best Philadelphia Oak Tanned, C. W. Arny, 301 and 303 Cherry Street, Philadelphia, Pa.

Boynton's Lightning Saws. The genuine \$500 challenge. Will cut five times as fast as an ax. A six foot cross cut and buck saw, \$6. E. M. Boynton, 80 Beekman Street, New York, Sole Proprietor.

For Steam Fire Engines, address R. G. Gould, Newark, N. J.

Brown's Coal Yard Quarry & Contractors' Apparatus for hoisting and conveying material by iron cable. W. D. Andrews & Bro. 414 Water St., N. Y.

Better than the Best—Davis' Patent Recording Steam Gauge. Simple and cheap. New York Steam Gauge Co., 46 Cortlandt Street, N. Y.

For Solid Wrought-iron Beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

For hand fire engines, address Rumsey & Co., Seneca Falls, N. Y.

All kinds of Presses and Dies. Bliss & Williams, successors to Mays & Bliss, 118 to 122 Plymouth St., Brooklyn. Send for Catalogue.

Mining, Wrecking, Pumping, Drainage, or Irrigating Machinery, for sale or rent. See advertisement, Andrew's Patent, inside page.

Presses, Dies & all can tools. Ferracute Mch. Wks. Bridgeton, N. J. Also 2 Spindle axial Drills, for Castors, Screw and Trunk Pulleys, &c.

Perfection—Patent Ears for Elliptic Spring Heads. Address George P. Cleaves, Concord, N. H.

A party intending to engage extensively in the hose knitting business wishes to obtain full information as to the best machines, prices, etc. Address H. Hutzler, 383 Central Avenue, Cincinnati, Ohio.

India Rubber—Manufacturers of Calendar rolls, and other machinery for the manufacture of India Rubber, can apply, with particulars, with a view to business, to C. E., P. O. Box 4090, New York.

To Grist Mill Machinists, &c.—Wanted a quantity of Grinding Machinery. Full particulars of any new or old process of grinding grain, or other materials, will insure business if approved. Address C. E., P. O. Box 4090, New York.

Wanted—Manufacturers for a large quantity of sewing machine attachments. Address H. & W. Bary, Detroit, Mich.

I want the best Swift. G. H. N. Cushman, Ottawa, Ill.

A New Machine for boring Pulleys, Gears, Spiders, etc. etc. No limit to capacity. T. R. Bailey & Vail, Lockport, N. Y.

Notes & Queries.

I represent herewith a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers.

1.—What will give a perfectly black, smooth and even surface to sheet iron, and how it is put on?—S. B. D.

2.—What is the best formula for making a good, durable slate paint, such as is used on blackboards for illustrations in schools, etc?—W. A. B.

3.—Will some one please give me directions for producing a dark glaze on stone ware, that will not melt or blister? I would like to know what glazing is used on Rockingham ware, and where the materials can be obtained.—J. J. K.

4.—I wish to construct a worm of cast or wrought iron about 14 inches long with the core $1\frac{1}{4}$ inches in diameter, and the flange or threads $5\frac{1}{2}$ inches in diameter, with about 3 inches pitch. The worm is to work in a cylinder $5\frac{1}{2}$ inches diameter, to act as a pusher, the same as meat cutter for stuffing sausage. Will some one give me the simplest and best way to make it?—J. D. L.

5.—In August last, at one of the stations on the Union Pacific Railroad, situated nearly 7,000 feet above the sea level, the thermometer being at 80, and the atmosphere exceedingly dry (no rain having fallen for months, so that the land around grew nothing but sage brush), a piece of ice about two pounds weight, laying on the floor and between the draft of two entrances, remained undissolved from 9 A. M. to 4 P. M., when the writer last saw it. Usually, under like circumstances, the ice would have dissolved in a few minutes. Is there any theory that will account for this?—C. P.

6.—Can any one give me a log of the English government steamer Comet, which, in 1835, steamed from Falmouth to Lisbon, being driven by Mr. Thomas Howard's small boiler? This was scarcely what we should call a boiler. The part exposed to the fire being double walled and filled with mercury, upon the inner surface jets of water were injected, periodically with the strokes of the engine, so that just enough high steam was formed on the blistering, sizzling plate to form two or three cylindrical of steam. In those days high steam was a distant acquaintance. In our days for exceptional purposes we see 300 lbs. already used, and for ballooning purposes, 500 lbs. talked of. High steam allows the use of small, and strong boilers, and this brings us to the query of whether the search for the smallest, most compact, and strongest does not lead us back to the principle of Howard. The Comet was reported to burn only 200 lbs. of coal where, with machinery and boilers of that day (1835) she would have burned 600 lbs. and only part of the saving can be and was attributed to surface condensers, which novelties (of that day) she was also provided with. I hope in America, where everybody and thing, animate and inanimate, is expected to carry 1,000 pounds steam or near it, you may be able to speak from experience about Howard's principle.—J. P. C., Jr., of England.

Answers to Correspondents.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries however, when paid for as advertisements at \$1.00 a line, under the head of "Business and Personal."

ALL reference to back numbers must be by volume and page.

J. C. was informed by the types in our last that hydrochloric acid might be used for dissolving gold quartz. It should read hydrofluoric acid.

I. P. asks for an answer to A. B. S.'s query of April 26, asking for a method of dyeing skins on the grain. A recently published work says: "Leather is dyed or stained by the application, with an ordinary brush, of any of the strong liquid dyes, in the cold or only gently heated, to the surface of the skin previously stretched on a board. The surface when dry is commonly finished off with white of egg and the pommel or shooting stick. Bookbinders employ copperas water as a black stain or sprinkle, a solution of indigo as a blue one, and a solution of salt of tartar or common soda as a brown one."

Can some one tell me how to render the water in my well fit for use? It has become foul by the presence of a large number of dead angle worms. The well is about 16 feet deep and has about three feet of water in it, which cannot be lessened much by the pump or any other means at hand. The bottom seems to be fine gravel and quicksand into which large numbers of the worms have crawled and died, giving to th

sand the same bad odor that the water has; and the water cannot be used on account of the bad odor.—E. L. Answer: The remedy is simple: Clean out your well thoroughly by means of buckets.

C. Y. K. says: Enclosed please find specimen of what I take to be a mineral, and I wish you to inform me what it is. Our police court wants a cage or two to use in our jail; can you inform me who makes the best? Answer: The mineral is iron pyrites, of no special value. As to police cages, it might be well for your people to advertise for the best.

L. S. W. asks:—Why have not steam brakes been employed to stop railway trains? Can you refer me to some work or works treating upon the subject of steam brakes upon railroads? What amount of force (power) is required to each car to effectually brake it? Answer: Steam brakes have been used on some of our railways, but on account of difficulties connected with the manipulation, such as condensation of steam, irregularity in steam pressure, freezing of pipes in winter, etc., we believe they have been abandoned. Accounts of the trials and of various steam brake devices, pressure of steam, etc., have been published in back volumes of the SCIENTIFIC AMERICAN. We call to mind no special work upon the subject.

G. W. D., of O., says:—We had occasion to repair a low steam heating arrangement for a dwelling which was furnished with an automatic water feeder; the feeder failed to work on account of the mud depositing under the copper float, which kept it from falling as the water fell in the boiler, in consequence of which the boiler became red hot. In disconnecting the regulator or feeder from the boiler, we held a light at the opening of one of the pipes, intending to look through, when an explosion occurred of great violence. A flame of fire squirted out of the pipe at least two feet long. The mud had a strong fishy smell. What kind of gas was it that ignited, and what produced it? Answer: The gas was produced by the decomposition of oil which must have been in the boiler floating on the water. When the water disappeared and the boiler reached the red heat, the oil was decomposed and converted into ordinary illuminating gas.

S. C. says:—How would it do to place the oxide of manganese in evaporating pans of a house furnace, instead of water, in order to refresh the oxygen as fast as consumed? Answer: Water is placed on stoves and house furnaces for the purpose of supplying the atmosphere of the dwelling with vapor, which is good for the health. The water does not supply oxygen to the atmosphere as you seem to suppose. The use of manganese as you propose would not add oxygen to the air, in any appreciable quantity. Salts of manganese are used in connection with steam in the production of oxygen.

R. B. G. says: Please give us a thesis on the subject of diamonds made from carbonic acid gas, as described in a Missouri paper, and purporting to have been cut from the New York World. Answer: Our correspondent refers to a sensation article which appeared in the World some time ago, in the form of a letter from a correspondent who alleged that, by a new and peculiar process, using carbonic acid gas, he had been enabled to solidify the vapor into pure carbon, thus producing diamonds artificially. In one night, he said, he had made himself a millionaire, etc. The letter was simply newspaper gas.

R. H. A., of Md., says, in reference to our reply to C. A. S., page 282: It seems to me that the reply is rather too strongly stated. I suppose Glasher's hygrometer—that chiefly used at government offices—to be one of those alluded to. Now this instrument holding one of its thermometer bulbs covered with water-saturated fabric, and exposed to a slight current of air only partially saturated, does not regularly and quietly give a true indication of the quantity of moisture, unless it is fully up to the dew point, and for this reason: A current of partially saturated air, projected upon a fabric fully saturated, removes water by evaporation more rapidly, and of course refrigerates more and gains a higher indication than it would if the same air were in quiet contact. This instrument, and those of similar plan, beautifully work out the laws of Nature, and it is their accuracy of work that renders them at times unreliable. They only indicate the condition of the air within one inch of the thermometer bulb. In contrast with this device is a woody fiber, formed by Nature, which, from the point of total dryness just short of disintegration, up to that of saturation, expands with regularity and exhibits no trifling or deceptive impulses, such as are to be found in the ingenious instrument with two thermometers. The dew point of a hygrometer made of woody fiber is fixed by adjustment in the same way as thermometers are marked; the bulb and tube are first made and the scale is then marked to suit.

HOW TO FIND THE RELATIVE DISTANCES OF THE EARTH FROM THE SUN.—Your correspondent D. whom we thank above enquiry, will not be aided by the reply of J. T. N. in the SCIENTIFIC AMERICAN of October 26. But D., may easily satisfy himself in the following manner: The further a body is from you, the smaller are its apparent angular dimensions, and the nearer it is to you, the greater are its apparent angular dimensions. If, by means of a telescope with cross hairs, D. observes the times of the transit of each limb of the sun at noon about June 30 and December 30, he will at the first date discover the sun's diameter to be about thirty-one and a half minutes of space, and at the latter about thirty-two and seven twelfths minutes of space; showing the sun to be farther from us in June than in December. The distances at the two periods are inversely proportional to the sines of half these angles, or, as the angles are small, are inversely proportional to the angles themselves, nearly; that is, the distance in June is to the distance in December, as 1955 to 1890, or as thirty-two seven twelfths to thirty-one and a half, nearly. The difference between the angular diameter of the sun at the two times mentioned equals 65 seconds of space, which can be easily measured. Suppose the first limb of the sun at noon passes a central wire $2' 06''$ before the second limb passes it, then (omitting a very minute correction), there being 1440 minutes of time in a day, and 21600 minutes of space in a circle if 1440 minutes of time give 21600 minutes of space, 2 minutes and 6 seconds of time will give $31\frac{1}{2}$ minutes of space, equal to the sun's angular diameter on that day. If this operation be repeated twenty times in a year at equal angular intervals; and distances inversely proportional to the sun's angular diameters, expressed, let us say for convenience, in seconds of space, be set off on straight lines drawn at these equal angular intervals from a fixed point, then the extremities of these lines will be found on the periphery of a closed curve, called an ellipse, of which the fixed point from which the distances are set off will be the focus. Thus the earth describes an ellipse about the sun, which is in the focus. Perturbations slightly alter the curve.—A. E.

D. W. S., of Ill., asks the old question: How many times will a wheel turn on its own axis in moving once around the circumference of a fixed wheel of the same diameter? He says the enquiry is creating some excitement in his vicinity and wants our opinion on the subject. Answer: This question was very fully discussed in the SCIENTIFIC AMERICAN, a few years ago, and caused almost as much excitement, not to say bitterness, in mechanical circles as the recent political contest between Grant and Greeley. One side claimed that the wheel turned *once* on its own axis, and were sure they were right; the other side alleged that the wheel turned *twice* on its axis, and denounced all who thought otherwise as fools, knaves, or villains of some sort. On account of the ill feeling likely to be engendered, we shall not at present renew the discussion in our columns. The appearance of an object often depends upon the color of the spectacles through which one looks. Such is apparently the case in regard to this wheel question. To him who sees that it turns once, it makes a single turn. To him who observes that it revolves twice, it makes two revolutions.

To B. F. R., query 15, page 281.—Cartridges are covered with common paper or cloth; and the covering is not dipped in any combustible solution, but the end is simply bitten off and the powder exposed to the flash of the percussion cap.—F. S. B., of Me.

To G. B. M., query 7, page 281.—Zinc can be freed from its impurities by exposing it to a white heat in an earthen retort, to which a receiver full of water is adapted; but the first portions, being liable to contain arsenic and cadmium, should be rejected.—F. S. B., of Me.