## 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.

Mittens.-%'s of all made in the country to-day on our machines. Lamb Knitting Machine Co., Chicope

Steamboats supplied with Pumps for every service by Valley Machine Works, Easthampton, Mass

Send for Special List of Second Hand Machinery Pond Machine Tool Co., Worcester, Mass.

The patent right of Brill's patent Printer's Chase, il lustrated in this number, is for sale. Address A. C. Pleyte, 1719 Walnut St., Milwaukee, Wis.

Wanted-First class Wood Pattern Maker, experienced in making patterns for brass castings. United Brass Co.,

Iron Planer, Lathe, Drill, and other machine tools of modern design. New Haven Mfg. Co., New Haven, Conn.

The leading Non-conducting Covering for Boilers, Pipes, etc., is Wm. Berkefeld's Fossil Meal Composition: Xinchthickness radiates less heat than any other covering does with two inches. Sold in dry state by the pound. Fossil Meal Co., 48 Cedar St., N. Y.

Machinists.—Spring Calipers and Dividers, with patent washers, made by J. Stevens & Co., Box 28, Chicoped

Try our Corundum and Emery Wheels for rapid cutting. Vitrified Wheel Co., 38 Elm St., Westfield, Mass.

The Providence Steam Engine Co., of Providence, R. I., are the sole builders of "The Improved Greene Engine."

Every variety of Rubber Belting, Hose, Packing, Gas kets, Springs, Tubing, Rubber Covered Rollers, Deckle Straps, Printers' Blankets, manufactured by Boston Belting Co., 226 Devonshire St., Boston, and 70 Reade St.

Stephens' Pat. Bench Vises and Planer Chucks. See adv., p. 76.

For sale.—Large Air Compressor, 24" x 24" air cylinder: steam cylinder, 18" x 24"; coupled to one shaft with cranks at right angles; also has 10' band, wheel 16' face. Good as new. Will be sold very low. Address Henry I. Snell, 135 N. 3d St., Philadelphia, Pa.

Experimental Machinery Perfected, Machinery Patterns, Light Forgings, etc. Tolhurst Machine Works, Troy, N. Y.

Bermuda Scientific Collections. Naturalist, Box3359, N. Y.

Wanted.—A first-class man to superintend a Sash. Blind, and Door Factory; outfitted with all late and improved machinery; working about one hundred hands. Must be sober, a good manager, and estimator on job work. To the right man a good salary and permanent employment will be given. Or I will sell a half interest in the above well established business. Address, with full particulars as to age, habits, qualifications, and recommendation, R. F. Learned, Natchez, Miss.

Whistles, Injectors, Damper Regulators; guaranteed. Special C. O. D. prices. A. G. Brooks, 261 N. 3d St., Phila. Brush Electric Arc Lights and Storage Batteries. Twenty thousand Arc Lights already sold. Our largest machine gives 65 Arc Lights with 45 horse power. Our Storage Battery is the only practical one in the market. Brush Electric Co., Cleveland, O.

The Cyclone Steam Flue Cleaner on 30 days' trial to reliable parties. Crescent Mfg. Co. Cleveland, O.

For Steam and Power Pumping Machinery of Single and Duplex Pattern, embracing boiler feed, fire and low pressure pumps, independent condensing outfits, vacuum, hydraulic, artesian, and deep well pumps, air comors, address Geo. F. Blake Mfg. Co. St., Boston; 97 Liberty St., N. Y. Send for catalogue.

Stationary, Marine, Portable, and Locomotive Boilers a specialty. Lake Erie Boiler Works, Buffalo, N. Y.

Wanted.—Patented articles or machinery to manufacture and introduce. Lexington Mfg. Co., Lexington, Ky. "How to Keep Boilers Clean." Book sent free by James F. Hotchkiss, 86 John St., New York.

Mills, Engines and Boilers for all purposes and of every descript. Send for circulars. Newell Universal Mill Co., 10 Barclay Street, N. Y.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J. For Power & Economy, Alcott's Turbine, Mt. Holly, N.J. Steam Boilers, Rotary Bleachers, Wrought Iron Turn Tables, Plate Iron Work. Tippett & Wood, Easton, Pa.

Send for Monthly Machinery List to the George Place Machinery Company 121 Chambers and 103 Reade Streets, New York.

If an invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent. \$40. Various other foreign patents may also be obtained. For instructions address Munn & Co., Scientific American patent agency, 3&1 Broadway, New York.

Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Steam Pumping Machinery of every description. Send for catalogue.

Nickel Plating.—Sole manufacturers cast nickel anure nickel salts, polishing compositions, etc. Com plete outfit for plating, etc. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty, St., New York.

Supplement Catalogue.—Persons in pursuit of information of any special engineering, mechanical, or scientific subject, can have catalogue of contents of the Sci-ENTIFIC AMERICAN SUPPLEMENT sent to them free. The Supplement contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York.

Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y. C. B. Rogers & Co., Norwich, Conn., Wood Working

Curtis Pressure Regulator and Steam Trap. See p. 14.

Machinery of every kind. See adv., page 78.

Woodwork'g Mach'y, Rollstone Mach. Co. Adv., p. 14.

Drop Forgings, Billings & Spencer Co., Hartford.Conn. We are sole manufacturers of the Fibrous Asbestos Removable Pipe and Boiler Coverings. We make pure asbestos goods of all kinds. The Chalmers-Spence Co., 419 East 8th Street, New York.

Rubber Skate Wheels. See advertisement, page 18.

Expanders. R. Dudgeon, 24 Columbia St., New York.

Emerson's Book of Saws free. Reduced prices for 1885. 50,000 Sawyers and Lumbermen. Address Emerson, Smith & Co., Limited, Beaver Falls, Pa.

Hoisting Engines, Friction Clutch Pulleys, Cut-off Couplings. D. Frisbie & Co., Philadelphia, Pa

Barrel, Keg, Hogshead, Stave Mach'y. See adv. p. 78 Swift's Patent Coffee Roasters and Mills, 30 sizes Lane Bros., makers, Box 276, Poughkeepsie, N. Y.

Munson's Improved Portable Mills, Utica, N. Y.

Machine for grooving chilled rolls for flour mills. Pratt & Whitney Co., Hartford, Conn.

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

The Porter-Allen High Speed Steam Engine. Southwark Foundry & Mach. Co., 430 Washington Ave., Phil.Pa. Seaming and Looping Machines, Patent Burr Wheels, Brushing Machines. Tubbs & Humphreys, Drawer 1637,

Young Men! Read This!

The VOLTAIC BELT Co., of Marshall, Mich., to send their celebrated ELECTRO- VOLTAIC BELT and other ELECTRIC APPLIANCES on trial for to men (young or old) afflicted with nervous debility, loss of vitality and manhood, and all kindred troubles. Also for rheumatism, neu-ralgia, paralysis, and many other diseases. Complete restoration to health, vigor, and manhood guaranteed. No risk is incurred, as thirty days' trial is allowed. Write them at once for illustrated pamphlet free.

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

## NEW BOOKS AND PUBLICATIONS.

LOCOMOTIVE ENGINE RUNNING AND MANAGEMENT. A treatise on locomotive engines. By Angus Sinclair. John Wiley & Sons, New York.

This book will be found especially valuable to engineers and mechanics who have worked their way into responsible positions, or who are doing so, through their personal energy and perseverance rather than by the aid of a regular course of study and the advantages of favorable connections. It is plainly written throughout, so that not only firemen and machinists, but those in no way connected with such business, can readily understand its statements and reasoning, yet it gives a vast amount of detail, derived from long experience of the writer as a practical engineer, and one having had branch of railway. It does not pretend to be anything of an ox: more than an elementary work in mechanical engineering, but will form a valuable addition to a class of practical instruction books now finding great favor with the public.

ORIGINAL RESEARCHES IN MINERALOGY AND CHEMISTRY. By J. Lawrence Smith. Edited by J. B. Marvin. Printed at Louisville, Ky., for presentation only.

This is a memorial volume, prepared at the request of the widow of the late Professor Smith, and containing a sketch of his life written by Dr. Marvin, at the request of the American Academy of Arts and Sciences. From 1842 to 1873 Professor Smith was prominent as an original investigator in the departments of chemistry and mineralogy, having been a lecturer in the Charleston Medical College and Professor of Chemistry in the University of Virginia, and afterward succeeding Professor Silliman in that department in the University of Louisville. He was one of the earliest to point out the mineral resources of the South, and was for a number of years a mining engineer in Turkey, where he went on solicitation of the Sultan through our Secretary of State. Professor Smith died February 12, 1883, in his 65th year.

SEASONAL CLIMATIC MAPS OF THE UNITED STATES. By Charles Denison. Rand, McNally & Co., Chicago.

These maps embrace five different presentations of the climatology of the United States on a substantially mounted chart 40 by 60 inches. One side of the chart his has four different views—one each for spring, summer, autumn, winter-and each showing, for those seasons, humidity, isothermal lines, direction of prevalent and wet and dry winds, altitudes, etc., while the other sides of a small quantity of some ethereal oil. shows the averages in the conditions in one large map for the whole country together. The various degrees between extreme moisture and extreme dryness are indicated by eight shadings, from deep blue to deep red. The data for these exhibits are compiled from reports of the United States Signal Office, but the way in which the information is here presented enables one to cover a very large field understandingly at a glance.

THE MAGAZINE OF AMERICAN HISTORY, edited by Mrs. Martha J. Lamb, has now entered upon its thirteenth volume. Each number of this publication always presents an admirable collection of papers, and maintains the high character of the gifted editor, who, in her history of New York city, displayed the highest qualities of an author. The magazine is as instructive as it is entertaining, its frontispiece in the February number being a portrait of the eminent Mohawk chief, George H. M. Johnson, or Onwanonsyshon, accompanied by a spirited sketch. Among other interesting articles, some of which are illustrated, are "The Early New York Post Office." "Benedict Arnold's March to Canada," "The Character of Andrew Jackson," and Andre's Landing Place at Haverstraw." The magazine is handsomely printed and illustrated, and is sold for 35 cents a copy, \$5 ayear. Office of publication, 30 Lafayette Place, New York city.

## Received.

Annual Report of the United States Secretary of the fiscal year ending June 30, 1884. Washington: Government Printing Office. (of feet in 40 miles by this sum, you will of the fiscal year ending June 30, 1884. Washington: Government Printing Office.)

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

THE FIREMAN'S GUIDE. A handbook on the care of boilers. By Karl P. Dahlstrom. E. & F. N. Spon, New York and London.

EE'S MAP OF THE INDUSTRIES OF PITTSBURG AND ALLEGHENY CITY. No. 2. Alex. G. Lee, Pitts-



HINTS TO CORRESPONDENTS.

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all, either by letter or in this department, each must take his turn.

Special Information requests on matters of personal rather than general interest, and requests for Prompt Answers by Letter, should be accompanied with remittance of \$1 to \$5, according to the subject, as we cannot be expected to perform such service without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Minerals sent for examination should be distinctly marked or labeled.

(1) G. F.—For ascertaining the volume of steam used in lifting water by an injector: From measurements of the suction tank and receiving tank ascertain the increase of bulk of receiving tank after a stated run of the injector in cubic feet of water, which mid-relied by 62 to pounds, the weight of one cubic foot of water, will give the amount of water derived from the steam in boiler. Multiply the weight of water thus ascertained by the tabular number of cubic feet of steam per pound of water for the pressure that you carry in the boiler, for the volume of steam used. You will find this table in most works on steam for every pound of

Tauton III	hres	sure. Inc	ab ror,	•		
15 lb. p	ressu	re 131⁄4 cu	bic fee	t stea	m=1 lb. w	ater.
20 1ъ.	41	111/2	**	и	=1 lb.	"
25 lb.	**	$10_{1}^{27}$	41	41	=1 lb.	**
30 lb.	**	$9\frac{100}{100}$		**	=1 lb.	
40 lb.	41	7 3 0 0		**	=1 lb.	41
50 lb.		$6_{100}^{49}$		41	=1 lb.	**
60 lb.	**	$5\frac{68}{100}$	**	66	=1 lb.	14
70 lb.	4.4	5 <del>าถึก</del>		**	=1 lb.	64

and so on. The temperature is not essential in any ordinary computation, as the volume of water discharged modifies the temperature and becomes the absolute basis of calculation.

(2) B. asks: What is considered the general analysis of ground beef bones? A. The following charge of the motive power and repairs of a prominent analysis by Heintz is given in Ure. It is of the femur

Animal matter30.58
Phosphate of lime
Fluoride of calcium 2.69
Carbonate of lime 6.99
Phosphate of magnesia 2.07

(3) J. M. C.—Roofing tile when properly laid have a life of several hundred years more or less, according with climate. Slate a little less. Slate is the cheapest. Roofing tile is made in New Jersey.

(4) G. P.—Make soft solder from tea lead by melting with equal part of block tin.

(5) H. A. P.—We presume annatoine is one of the numerous synonyms for annatto, the yellow coloring matter.

(6) J. H. D. asks for a cement or paste that will fasten cotton cloth on sheet iron, that will withstand the action of weather and rain. A. Use a cement made by melting equal parts of asphalt and gutta percha, and applying the mass hot under a press. See also waterproof cement, Scientific American Sup-

(7) F. W. S. asks: What can be added to ashes from bituminous coal, that will form good and inexpensive walks for yards and grounds used only for pedestrians? How made and how put down? A. Good hydraulic cement, equal parts by measure. Mix dry, then wet the whole quickly as in making mortar, and spread smoothly with shovel. Two inches thick is sufficient for ordinary paths.

(8) W. J. S. asks: What will remove the coloring matter. those black flesh worms from the face? A. Cover the parts affected with a pomade consisting of kaolin 4 parts, glycerine 3 parts, acetic acid 2 parts, with the addition

(9) B. F. S.—For removing ink see the answer given to queries Nos. 39 and 41, in our issue of remove the scar, except time. The skin is burnt, and it November 22, 1884. Manhattan Island is 131/2 miles long, and 21/4 miles in width at certain points.

(10) J. B. asks how many steam boilers there are in the United States. A. According to the census of 1880, there were 72,304 boilers in use in manufacturing industries, and 5,403 steam vessels. Poor also

(11) W. C. B.—Flexible tubes, such as rubber hose and the like, are largely used for transmitting the elements of power, such as steam, air, and water; but the motion due to such power has to be developed at the exit end of such tubes by appropriate appliances. Your half horse power from a blast is feasible, but we cannot construct your appliance.

(12) E. A. P. asks for receipt for making green ink that will copy. A. The receipt for a green ink is given on page 2498 of Scientific Ameri-CAN SUPPLEMENT, No. 157. The addition of a small quantity of glycerine will cause it to copy. An aniline the water. green soluble in water and mixed with glycerine with a little alcohol should likewise give satisfactory results.

(13) E. W. A.—Locomotive wheels and car wheels vary much in size. If you will multiply the diameter of any wheel by 3.1416, and divide the number of feetin 40 miles by this sum, you will obtain the whole number of revolutions in 1 hour; divide this paint that in a short time, it can be readily removed

(14) J. E. L. asks: How many pounds to the square inch is called high, and how many pounds is called low, pressure of steam, when used in buildings for heating purposes and return to boiler? A. From 10 pounds upward is generally called high pressure; from 0 pound to 10 pounds, low pressure. Much of our low pressure heating is efficient with from 1 to 3 pounds.

(15) E. R. asks (1) what to add to China ink to make it flow easily and without interruptions on tracing cloth. A. It has been found that if genuine Indian ink be rubbed with good black ink until it will flow easily from a pen, excellent results will ensue. 2. Whether there is any possibility of restoring the transparency of tracing cloth, when it has been damaged by water drops, so that in copies made by the blue process no stains will be noticed, and what should be done to the purpose? A. Tracing cloth is coated with a varnish which varies with different makers, so that the spots can be restored by coating them with the proper varnish, whatever it may be. Frequently equal parts of Canada balsam and turpentine are used.

(16) P. B.—Encke's comet is not visible as yet to the naked eye. For other particulars see illustrated article in Scientific American, January 24, 1885. A planet is said to be stationary when the or bital motion of the earth and the planet so coincide that the planet appears for a short time not to move in its position among the stars. The nodes are the points where the orbits of the planets intercept the ecliptic, descending south, ascending north.

(17) P. H. McN. asks: Is there any loss of motor power in the use of the reciprocating steam engine in transferring that power from the reciprocating to the rotary motion, through the crank and its connections to the main shaft? If so, what per cent? I find that engineers differ on this subject. A. Engineers do not differ so much as to the fact as they do in the methods and pecessity of overcoming the apparent loss by special contrivances. Although the actual loss may be about 37 per cent, the smoothness of motion of the crank and its ease of reversion are well worthy of its loss of power over the jerky rectilinear motion. Modern engineering practice has long since settled the theoretical dispute in favor of the crank.

(18) F. J. C. asks for a receipt for frosting silver. A. Dip the article in a solution of nitric acid and water, half and half. for a few minutes, then wash well in clean water, and dry in hot sawdust. When thoroughly dry, brush the sawdust away with a soft brush, and burnish the parts required to be bright.

(19) F. H. W. asks: 1. Is there anything better than fluoric acid with which to etch on glass? A No. The sand blast is used to a certain extent. 2. How is the matter applied, if there is any other way than by the use of wax? A. Two slightly differing processes by means of fluoric acid are described, the first on page 2690 of Scientific American Supplement, No. 169, and the second on page 4994 of SCIENTIFIC AMERICAN SUP-PLEMENT, No. 313. 3. What is the fluid sometimes called diamondink, used to etch glass? A. Diamondink is a trade name given to some particular variety of etching ink. See page 232 of SCIENTIFIC AMERICAN, for October 11, 1884, for method of manufacturing the

(20) Merlin asks for a formula for making violet or purple (the best) ink for using with the hektograph. A. The ink you desire is prepared by dissolving one part aniline blue violet in a mixture of seven parts water and one of alcohol.

(21) W. T. G. asks the most effective stain for ash. I desire to stain a dark color, say imitation of ebony. If this wood can be effectively stained ebony, will you be good enough to give me a good recipe for such a stain, and say whether it should be put on hot or cold. A. We recommend the following: Dissolve 4 ounces shellac with 2 ounces borax in 1/2 gallon of water. Boil until a perfect solution is obtained. then add 1/4 ounce glycerine, after which add, in sufficient water, soluble aniline black, and the mixture is ready for use. See also process given under "Dyeing Wood Black," in SCIENTIFIC AMERICAN SUPPLEMENT, No. 207.

(22) J. E. J. desires a formula for mixing water colors, so as to form cakes that won't crack in drying. A. Water colors mixed with gelatine, and afterward fixed by washing with a solution of alum or with curd of milk, washed and pressed, then dried on fine net, and, when required for use, mixed with water and

(23) Q. C. A. asks: 1. Is there any known chemical or substance that will remove the stain or scar produced by the burn of sulphuric acid (on the flesh)? It was done about two months ago, and left a dark red stain and scar. A. We know of nothing that will will take time for a new cuticle to grow. 2. Please give me a receipt for gold ink. I can make it, but have trouble in keeping the bronze held in solution; it settles. A. For gold ink, take 24 leaves gold: 16 ounce bronze gold; 30 grains best honey; 4 drachms gum arabic; 30 drops spirits of wine; 4 ounces rain water. Rub the gold with the honey and gum, and having mixed i with the water, add the spirit.

(24) V. C. H.—To definitely express an opinion concerning the proper means of preventing boiler scale is almost impossible without an exact knowledge of the composition of the water u ed, etc. On page 4553 of Scientific American Supplement, No. 286, you will find an article on the "Complete Prevention of Boiler Incrustations." In SUPPLEMENT, No. 187, tannates of soda are recommended. In general all woods rich in tannin are used. Filtering through iron may be advantageous for drinking purposes, but we do not see that it will affect the lime salts contained in

(25) A. P. C. asks how to remove painted letters from a brick building. A. To properly answer your question, the conditions must be more thoroughly explained. To remove paint from stone, use three pounds of common washing soda dissolved in a gallon of boiling water. This, if applied hot, will so soften the with a stiff ecrubbing brush.