

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. The publishers of this paper guarantee to advertisers a circulation of not less than 50,000 copies every weekly issue.

Chard's Extra Heavy Machinery Oil.
Chard's Anti-Corrosive Cylinder Oil.
Chard's Patent Lubricene and Gear Grease.
R. J. Chard, Sole Proprietor, 6 Burling Slip, New York.
Wanted—Small Clean Brass Castings, 300 to 500 lb. weekly. Foundry address "Cash," Box 773, N. Y. city.
No. 4 Blaisdell Drill, good as new, Bolt Cutter, several Second-hand Lathes, Engines, and Boilers, for sale by Wm. M. Hawes, Fall River, Mass.
The Inventors' Institute, New York, has removed to the Cooper Union Building. Sales of Patent Rights negotiated and Inventions exhibited for subscribers. Send for circular.
Fragrant Vanity Fair Tobacco and Cigarettes. 7 First Prize Medals—Vienna, 1873; Philadelphia, 1876; Paris, 1878; Sydney, 1879—awarded Wm. S. Kimball & Co., Rochester, N. Y.
The most durable and economical protective coatings in the world for tin roofs, exposed brick walls, etc., are H. W. Johns' Asbestos Roof Paints. They are prepared ready for use in six standard colors, and owing to their wonderful covering properties, cost the consumer no more than the cheap articles commonly used. They are for sale everywhere. Samples and price lists will be sent free by the H. W. Johns Mfg. Co., sole manufacturers of genuine Asbestos materials, 87 Maiden Lane, New York.

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.
Jenkins' Patent Gauge Cock; best in use. Illustrated circular free. A. W. Cadman & Co., Pittsburg, Pa.
Mr. Ely, of Afton, N. J., cut thirteen acres of heavy grass in five hours, July 2, with the Eureka Mowing Machine. It is the best mower made. Farmers send for illustrated circular to Eureka Mower Co., Towanda, Pa.
Interesting to manufacturers and others.—The world-wide reputation of Asbestos Steam Pipe and Boiler Coverings, Roofing, etc., has induced unscrupulous persons to sell and apply worthless articles, representing them as being made of Asbestos. The use of Asbestos in these and other materials for structural and mechanical purposes is patented, and the genuine are manufactured only by the H. W. Johns Mfg. Co., 87 Maiden Lane, New York.

Parties desirous of contracting for the construction of Wells of extra large capacity, may address P. O. Box 1150, New Haven, Conn.
The E. Stebbins Manuf'g Co. (Brightwood, P. O.), Springfield, Mass., are prepared to furnish all kinds of Brass and Composition Castings at short notice; also Babbitt Metal. The quality of the work is what has given this foundry its high reputation. All work guaranteed.

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.

Improved Rock Drills and Air Compressors. Illustrated catalogues and information gladly furnished. Address Ingersoll Rock Drill Co., 1 1/2 Park Place, N. Y.
Collection of Ornaments.—A book containing over 1,000 different designs, such as crests, coats of arms, vignettes, scrolls, corners, borders, etc., sent on receipt of \$2. Palm & Fechteler, 403 Broadway, New York city.

Packing once tried always used. Phoenix Packing from 1-16 up in spools or on coils. Phoenix Packing Company, 108 Liberty St., N. Y.
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., Pittsburg, Pa.
Malleable and Gray Iron Castings, all descriptions, by Erie Malleable Iron Company, Limited, Erie, Pa.

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

For the best Stave, Barrel, Keg, and Hoghead 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.
Gun Powder Pile Drivers. Thos. Shaw, 915 Ridge Avenue, Philadelphia, Pa.

Light and Fine Machinery to order. Foot Lathe catalogue for stamp. Chase & Woodman, Newark, N. J.
Best Oak Tanned Leather Belting. Wm. F. Forepaugh, Jr. & Bros., 531 Jefferson St., Philadelphia, Pa.

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

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.

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.

Presses, Dies, and Tools for working Sheet Metal, etc. Front & other can tools. Bliss & Williams, B'klyn, N. Y.
Eclipse Portable Engine. See illustrated adv., p. 317.

The Student's Illustrated Guide to Practical Draughting. By T. P. Pemberton. Sent on receipt of price, one dollar. Address T. P. Pemberton, 5 Dey St., Room 13, New York.

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.

Horizontal Steam Engines and Boilers of best construction. Atlantic Steam Engine Works, Brooklyn, N. Y.
Peck's Patent Drop Press. See adv., page 333.

Reed's Sectional Covering for steam surfaces; any one can apply it; can be removed and replaced without injury. J. A. Locke, Agt., 32 Cortlandt St., N. Y.
For Yale Mills and Engines, see page 316.

Rollstone Mac. Co.'s Wood Working Mach'y ad. p. 301.
Machine Knives for Wood-working Machinery, Book Binders, and Paper Mills. Also manufacturers of Solomon's Parallel Vise, Taylor, Stiles & Co., Riegelsville, N. J.
Clark Rubber Wheels adv. See page 317.

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

Blake "Lion and Eagle" Imp'd Crusher. See p. 333.
Rubber Hose and Linen Hose; all sizes in stock and to order. Greene, Tweed & Co., 118 Chambers St., N. Y.

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. 332.
The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.
For best Indirect Radiators, see adv., page 333.

The "Fitchburg" Automatic Cut-off Horizontal Engines. The "Haskins" Engines and Boilers. Send for pamphlet. Fitchburg Steam Engine Co., Fitchburg, Mass.
Eagle Anvils, 10 cents per pound. Fully warranted.

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

Diamond Engineer, J. Dickinson, 64 Nassau St., N. Y.
4 to 40 H. P. Steam Engines. See adv. p. 317.
Nickel Anodes, Nickel Salts, Pumice Stone, Rouge, & Composition for Polishers. Greene, Tweed & Co., N. Y.

Air Compressors. Clayton Stm. Pump Works, B'klyn, N. Y.
The best Truss ever used. Send for descriptive circular to N. Y. Elastic Truss Co., 683 Broadway, New York.
Houston's Four-Sided Moulder. See adv., page 332.

Magic Lanterns, Stereopticons, and Views of all kinds and prices for public exhibitions. A profitable business for a person with small capital. Also lanterns for home amusement, etc. Send stamp for 116 page catalogue to McAllister, Mfg Optician, 49 Nassau St., New York.

H. A. Lee's Moulding Machines, Worcester, Mass.
Wanted—A First-class, Second-hand Planer, 42' x 42", to plane 16' to 18'. Give full description. Noble & Hall, Erie, Pa.

New Economizer Portable Engine. See illus. adv. p. 332.
Rubber Packing, Soap Stone Packing, Empire Gum Core Packing; quantities to suit. Greene, Tweed & Co.
Wm. Sellers & Co., Phila., have introduced a new injector, worked by a single motion of a lever.

Saw Mill Machinery. Stearns Mfg. Co. See p. 333.
Ore Breaker, Crusher, and Pulverizer. Smaller sizes run by horse power. See p. 333. Totten & Co., Pittsburg.
Vacuum Cylinder Oils. See adv., page 333.

Lightning Screw Plates and Labor-saving Tools, p. 333.

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) M. asks how many horse power can be obtained from an engine with cylinder 8 inches in diameter by 11 in length, working 70 strokes per minute, and supplied with steam at a pressure of 60 pounds. A. With 60 lbs pressure of steam in the boiler, probably from 10 to 12 horse power. See SUPPLEMENT, 253, for rules for calculating horse power of engines.

(2) W. C. G. writes: I have always been led to suppose the atmospheric pressure to be 15 lb. to the square inch. How does it come that the vacuum gauge shows 30 lb.? A. It is 30 inches of mercury; not 30 lb. pressure, as you suppose. With the mercury column gauge 2 inches height of column is equal 1 lb. pressure nearly, hence a 30 inch column is only equal to 15 lb.

(3) R. S. asks: In what way do yacht engines, going at a speed of twenty-six miles an hour, gain their speed? Is it by gearing or direct action, and what sized engine would it take to run a boat 35 x 8 feet at that speed? A. The speed you mention is one which has not been attained fairly through the water. In these high-speed yachts everything else is sacrificed to speed.

No power you could put in your boat (35 x 8 feet) would give it a speed of twenty-six miles per hour.

(4) G. C. writes: We have under construction a pair of compound engines; the sizes of cylinders are, two 8 inches by 10 inches, and two 16 inches by 10 inches, for a yacht which we are now having built. We purpose using a keel or pipe condenser, and, under the circumstances, the pump will be about 10 inches above the condenser pipe. What we want to ask you is as follows: 1. Can a single acting pump with discharge valve (Corliss style) clear the pipe from water? A. Yes. 2. If a foot valve should be placed just below the pump would it assist in emptying the pipe? Is a foot valve under the circumstances absolutely necessary? A. A foot valve is necessary in your case. 3. The size of our pump is 7 inches diameter by 2 inch stroke, is it large enough? A. Not half large enough. Make it 5 inch to 6 inch stroke.

(5) F. C. S. writes: We are running a double set of machinery such as is generally used in a shoe manufactory, also an elevator, with an engine 6x14, making 120 revolutions at 60 lb. of steam. Now we propose to add on nearly as much again machinery with the same engine, by increasing its speed to 170, and carry 70 lb. of steam. Is it practicable? A. Yes.

(6) S. McC. writes: I am building an engine for a small steam yacht (similar to the Black Hawk, No. 14. SCIENTIFIC AMERICAN SUPPLEMENT), 4 inch bore by 4 1/2 stroke. What size steam ports and feed pipe would you recommend to get the greatest possible speed? A. Steam ports 3/4 inch by 3 1/4 inch; exhaust ports 3/8 inch by 3 1/4 inch. A feed pipe 3/4 inch diameter will be ample.

(7) S. A. H. asks: What is the best arrangement of carburetor to be used in machine formaking gas from benzene? Have tried filling a vessel with cotton and saturating with benzene (80°), and forcing air through it, but the cotton packs so solid in short time that the air won't permeate it. A. Use Sisal hemp instead of cotton.

(8) C. E. K. asks: 1. Is it possible for any individuals to be so charged with electricity (naturally) that, by approaching a finger to a gas jet, a spark will be emitted from the finger of sufficient strength to ignite the gas? A man of good authority says he witnessed such a performance in Denver. A. The human body is not a generator of high tension electricity, but it frequently becomes charged with it by the friction of the shoes on the carpet when the conditions are favorable. It is not at all uncommon to light the gas with an electric spark from the tips of the fingers, after walking over the carpet, and it may be done in the winter in almost any house heated by a furnace, provided the atmosphere is in a favorable state. 2. Is there any book of designs for amateur turners in wood and metals? A. Yes; you should write the booksellers and dealers in scroll saws and lathes who advertise in our columns.

(9) S. D. W. asks: 1. Does the alarm or whistling buoy give out its warning in a dead calm and smooth sea? A. Yes. 2. From where does it derive its power? A. The buoy has a constant rising and falling motion from the swell when there is no sea.

(10) W. H. K. writes: 1. I intend building a steam yacht (Sharpie model) 15 feet long, 4 1/2 feet beam amidships, 2 feet in depth. Please give me the dimensions of the boiler, cylinder, stroke. A. Engine 2 1/2 inches cylinder by 4 inch stroke; boiler 20 inches diameter by 34 inches high, with 1 1/4 inch tubes; propeller 18 inches to 20 inches diameter. 2. Do you think the boiler for a steam yacht, described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 182, is perfectly safe? A. If well made, yes. 3. Can I build a good canoe or row boat with the sides exactly perpendicular, and at a right angle with the bottom? A. Yes, if you give beam enough so that the boat is not crank. 4. Please give me a cheap method of waterproofing tent drilling. A. See SCIENTIFIC AMERICAN, Vol. 39, p. 331 (9). 5. What is meant by 8 oz. canvas, 10 oz., etc.? A. Weight per yard. 6. Where can I obtain a book on canoe building? A. We know of no work specially devoted to this subject. Consult back numbers of the SCIENTIFIC AMERICAN SUPPLEMENT. 7. Can I build a folding canvas canoe, and where can I obtain the plans, etc.? A. There have been several patents taken out for folding canvas boats. Several of them have been described in the SCIENTIFIC AMERICAN. You can obtain copies of the patents at the usual rates.

(11) J. B. S. asks: How can I melt pure gum rubber? A. You cannot melt it without partial decomposition. It may be softened by a moderate heat or by hot water so as to admit of moulding.

(12) C. W. J. asks for a sure and simple cure for warts. A. Touch the warts daily with nitric acid. It is said that they soon disappear under this treatment.

(13) H. A. H. asks: What preparation other than emery can be used to remove rust stains in the barrels of a breech loading gun? It has been proven that the too frequent use of emery alters the pattern. A. Dilute sulphuric acid will remove rust but will not render the surface smooth, and it will probably alter the "pattern" as quickly as emery. Better protect the barrel against rust.

(14) H. B. P. writes: A friend and myself are building a small launch engine of the following size: Cylinder 2 1/2 inches, by 5 inches, steam pressure in boiler, 110 lb. to square inch; number of revolutions of screw per minute, about 220. Please inform me: 1. What sized boiler we would require? A. A vertical tubular boiler, about 18 inches diameter and 34 inches height. 2. What sized boat the engine would drive? A. 15 feet or 16 feet in length and 48 to 50 inches beam. 3. What would be the diameter and pitch of screw? A. Propeller 18 inches diameter and 30 to 34 inch pitch.

(15) H. B. B. asks for a metal or alloy that can be easily melted on a common kitchen stove, that will cast readily, stand friction tolerably well, and will not be expensive. A. Use type metal (old type). 2. Out of which paper, the SCIENTIFIC AMERICAN or its SUPPLEMENT, can I get the more mechanical knowledge and information generally? A. Every scientific student and mechanic should have both papers. After sub-

scribing for both we think you will not dispense with either of them. 3. Everything being equal, which will go the faster and be more economical, a boat furnished with side wheels or a propeller? A. In a large boat with light draught, side wheels; in a very small boat, or very deep or changeable draught, screw propeller.

(16) G. W. L. writes: I bought a second hand engine and boiler. It is a locomotive boiler; the engine is horizontal. Not having any force pump to test it with, I filled it full with cold water, then fired it up until gauge showed 73 lb. Now, I would like to know whether you think it would be safe to carry fifty pounds steam pressure? A. We could not say without an examination of the boiler. 2. Could I make a foundation of concrete for engine, and would it be as cheap as one of stone or brick, and could I make foundation of concrete myself; if so, how is concrete made? Engine is nine by twelve inch cylinder. A. You would probably fail with concrete foundation. Use brick or stone. 3. The steam gauge I got with old boiler I put on another boiler to try it with steam gauge on boiler. When the steam gauge used regular on boiler indicated fifteen pounds pressure, the other would only indicate one pound; then when the steam gauge used regular indicated seventy pounds pressure, the other only indicated fifty pounds. I would like to know the cause of it, if I am not asking too much. A. It is evident one or both your gauges need correcting. You should have them tested.

(17) F. G. writes: I have been greatly interested by an article entitled "Value of Swamp Muck," contained in No. 5, Vol. 43, of the SCIENTIFIC AMERICAN. Please tell me in what shape nitrogen can be sold, and by what process it can be brought to that shape. A. Nitrogen alone has no commercial value. Its proportion in the fertilizer merely serves as an index of the richness of the latter in substances which yield, in the process of decomposition, ammonia or ammoniacal compounds, readily assimilated by the vegetable or plant. 2. I have a cellar dug in soft wet soil. I intend to arch it with cement mixed with sand and crushed shells. What should be the proportion of the mixture? A. You will find full directions for mixing cements in SUPPLEMENT 133. 3. What radius would you consider safe for the arch? A. It would be impossible to say without knowing the size and proportions of the cellar.

(18) G. R. F. writes: I want to make a railroad to run a quantity of stone a distance of about a quarter of a mile, to build a pier. I have heard that there are wooden roads in the United States doing good work. Would hard wood rails, without iron facings, answer for such a purpose, to use ordinary railroad wagon wheels, and carry a load of, say, two tons? A. Yes, such roads are in successful use at mines in the northern part of this State; but the load must be governed by the character of the timber.

(19) L. B. C. asks: Would the upper pipe from a waterback in a stove carried up stairs and attached to a coil and then returned to the boiler below give out enough heat to make a room comfortable in winter, and would it obstruct the circulation enough to cause a cracking sound in the pipes? We learn hot water is being used for heating buildings in New York. Cannot the steam and hot water in the ordinary copper boiler generally used be utilized as above stated? A. A small room may be heated in this way, but the trade should not recommend it, as it is not possible to warm a room from the same waterback and keep the water in the boiler as hot as before. If the room is of more importance than the boiler, take the pipe first to the coil, and the return from the coil to the boiler; but if you wish to get the hottest water at the boiler, take the connection for the coil from the top of the boiler and return to the bottom. The pipe from the back, or boiler to the coil, should rise as directly as possible to the highest point of the coil, at which point an air cock should be placed, thence gradually descend through the pipes to the return. The rising pipe should be covered, so as to prevent loss of heat until the water gets to its greatest height.

(20) "Ventilator" asks for the best method of ventilating an office. We have tried several ways, but they all cause the inmates to take cold. A. If the air admitted through the ventilator is in such abundance as to cause a draught, it should be remedied, but we think the trouble lies with the position the heating apparatus (coils, stove, or register) occupies in a room. When the source of heat in a room is in the center, or against the rear or inner (partition) walls, the natural course of the currents of air in that room are up at the heater and down at the coldest sides of the room, and especially in front of the windows; from thence it flows along the floor to the heater again, and any one in this return cold current is apt to take cold. If your outside walls are plastered on the bricks, have them fired and replastered, and heat with a long coil, run the length of the outside walls.

(21) T. H. S. writes: 1. I have a factory the rooms of which are 100 feet long and 70 feet wide and 14 feet high, fitted with double windows, which I purpose heating with 2 inch wrought iron pipes suspended in the rooms and supplied with steam from the boiler. Can you inform me how many rows of pipe will be required? Give the number of square feet of heating surface required for 100 cubic feet of air space. A. Allow from one-half to three-fourths of a square foot of pipe surface to each square foot of glass in the windows. For more data on this question, see SCIENTIFIC AMERICAN, January 17, 1880, page 39. 2. Can a room of same size as the foregoing, which is below the level of the boiler, be satisfactorily heated by hot water so as to avoid wasting the condensed water, or, if heated by steam, is there any means by which the condensed water can be returned to the boiler without pumping? A. Any of the direct-return steam traps will return the water from below the water line into the boiler without the help of a pump, if the main distributing steam pipes are large enough.

(22) E. W. L. asks for a receipt for a preparation that will prevent iron rust on bottom of aquarium tanks? Have used asphaltum varnish, but same wears off in a short time. A. Good asphaltum varnish is about the best thing.