

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.

Church Pipe Organs, new and second-hand, ready for delivery. Send for particulars. Henry Erben & Co., Organ Builders, East 23d St. near 2d Ave., New York.

Portable and Stationary Engines; Boilers of all kinds; 45 Cortlandt St., N. Y. Erie City Iron Works, Erie, Pa.

For best Cylinder Oil, R. J. Chard, New York.

Bolt Forging Machine & Power Hammers a specialty. Send for circulars. Forsaith & Co., Manchester, N. H.

Pulverizing Mills for all hard substance and grinding purposes. Walker Bros. & Co., 23d and Wood St., Phila.

Best Steam Pipe & Boiler Covering. P. Carey, Dayton, O.

Alcott's Turbine received the Centennial Medal.

Cornice Brakes. J. M. Robinson & Co., Cincinnati, O.

Sperm Oil, Pure. Wm. F. Nye, New Bedford, Mass.

Power & Foot Presses, Ferracute Co., Bridgeton, N. J.

Painters' Metal Graining Plates. J. J. Callow, Cleveland, O.

Boilers & Engines cheap. Lovegrove & Co., Phila., Pa.

Foot Lathes, Fret Saws, 6c., 90 pp. E. Brown, Lowell, Ms.

Notice to Inventors, Capitalists, and Ship Builders.—Assistance wanted to take out valuable inventions. Address M. E., Box 275, Shelby, O.

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

National Steam Pump, adapted to every possible duty. W. E. Kelly & Bro., 46 Cortlandt St., N. Y.

Scientific American to sell—all 52 vols. A. F. Park, Troy, N. Y.

Patent Wood-working Machinery, Band Saws, Scroll Saws, Friezers, etc. Cordesman, Egan & Co., Cincinnati, O.

Dead Pulleys, that stop the running of Loose Pulleys and Belts, taking the strain from Line Shaft when Machine is not in use. Taper Sleeve Pulley Works, Erie, Pa.

Wanted.—Exclusive control of a Patented Article to sell to Housekeepers; manufacturing cost not to exceed 25 cents. Will push a salable article on royalty. Address Lock Box 1308, Cincinnati, O.

For Heavy Punches, Shears, Boiler Shop Rolls, Radial Drills, etc., send to Hilles & Jones, Wilmington, Del.

New Patent (Eastman's) Miter Cutting Machines, specially adapted to Picture Frame making, manufactured by Witherby, Rugg & Richardson, Worcester, Mass.

2d hand Planers, 7' x 30", \$900; 6' x 24", \$325; 5' x 24", \$200; sc. cutt. b'k g'd Lathes, 9' x 28", \$200; A. C. Stebbins, Worcester, Mass.

Valuable Invention to users of Steam Boilers. See advt., page 318, May 18, 78. Address U. S. Automatic Stoker Co., No. 2 Chestnut St., Philadelphia, Pa.

Solid Emery Vulcanite Wheels—The Solid Original Emery Wheel—other kinds imitations and inferior. Caution.—Our name is stamped in full on all our best Standard Belting, Packing, and Hose. Buy that only. The best is the cheapest. New York Belting and Packing Company, 37 and 38 Park Row, N. Y.

Hydraulic Presses and Jacks, new and second hand. Lathes and Machinery for Polishing and Buffing metals. E. Lyon & Co., 470 Grand St., N. Y.

Improved Wood-working Machinery made by Walker Bros., 73 and 75 Laurel St., Philadelphia, Pa.

For Town and Village use, comb'd Hand Fire Engine & Hose Carriage, \$350. Forsaith & Co., Manchester, N. H.

Zero Refrigerator, with cooler. Centennial award. Send for catalogue. A. M. Lesley, 372 Sixth Ave., N. Y.

The SCIENTIFIC AMERICAN Export Edition is published monthly, about the 15th of each month. Every number comprises most of the plates of the four preceding weekly numbers of the SCIENTIFIC AMERICAN, with other appropriate contents, business announcements, etc. It forms a large and splendid periodical of nearly one hundred quarto pages, each number illustrated with about one hundred engravings. It is a complete record of American progress in the arts.

Nickel Plating.—A white deposit guaranteed by using our material. Condit, Hanson & Van Winkle, Newark, N. J.

Cheap but Good. The "Roberts Engine," see cut in this paper, June 1st, 1878. Also horizontal and vertical engines and boilers. E. E. Roberts, 107 Liberty St., N. Y.

Best Turbine Water Wheel, Alcott's, Mt. Holly, N. J.

For the best Bone Mill and Mineral Crushing Machines—five sizes, great variety of work—address Baugh & Sons, Philadelphia, Pa.

Warranted best and cheapest Planers, Jointers, Universal Woodworkers, Band and Scroll Saws, etc., manufactured by Bentel, Margedant & Co., Hamilton, Ohio.

Mill Stone Dressing Diamonds. Simple, effective, and durable. J. Dickinson, 64 Nassau St., N. Y.

Machine Cut Brass Gear Wheels for Models, etc. (New List.) D. Gilbert & Son., 212 Chester St., Phila., Pa.

The only genuine Geiser Self-regulating Grain Separator. Address the Geiser Manuf. Co., Waynesboro' Franklin Co., Pa.

Skinner Portable Engine, Improved, 2 1-2 to 10 H. P. Skinner & Wood, Erie, Pa.

Manufacturers of Improved Goods who desire to build up a lucrative foreign trade, will do well to insert a well displayed advertisement in the SCIENTIFIC AMERICAN Export Edition. This paper has a very large foreign circulation.

The Cameron Steam Pump mounted in Phosphor Bronze is an indestructible machine. See ad. back page. Bound Volumes of the Scientific American.—I have on hand bound volumes of the Scientific American, which I will sell (singly or together) at \$1 each, to be sent by express. See advertisement on page 14. John Edwards, P. O. Box 786, N. Y.

Friction Clutches for heavy work. Can be run at high speeds, and start gradual. Safety Elevators and Hoisting Machinery a specialty. D. Frisbie & Co., New Haven, Ct.

1,000 2d hand machines for sale. Send stamp for descriptive price list. Forsaith & Co., Manchester, N. H.

For Power & Economy, Alcott's Turbine, Mt. Holly, N. J. Address Star Tool Co., Providence, R. I., for Screw Cutting Engine Lathes of 13, 15, 18, and 21 in. swing.

Improved Steel Castings; stiff and durable; as soft and easily worked as wrought iron; tensile strength not less than 65,000 lbs. to sq. in. Circulars free. Pittsburgh Steel Casting Company, Pittsburgh, Pa.

Presses, Dies, and Tools for working Sheet Metals, etc. Fruit and other Can Tools. Bliss & Williams, Brooklyn, N. Y., and Paris Exposition, 1878.

Notes & Queries

(1) R. G. McC. wishes to know how to prevent quicksand from coming into the bottom of a well. A. We think you will have to deepen the well considerably below the quicksand, going down with a tight case.

(2) J. E. T. asks for a test to determine the quality or purity of milk. A. Consult SCIENTIFIC AMERICAN SUPPLEMENT No. 73, p. 1, 162.

(3) L. A. G. says: In dyeing cotton with scarlet and blue anilines, I find the colors fade and rub off; can you tell me of something to fasten them that will not destroy the brilliancy of the colors? A. The cottons are prepared for 4 or 5 hours in $\frac{1}{4}$ of their weight of sumac (or pale myrabolans), working in the cold that the yellow coloring matter may not take on the fiber. The goods may then be dyed in the aniline color beck, to which a little soap has been added. If it is not desired to use soap—as for blues which have to be acidified—the goods after treatment with sumac are steeped for one hour in a solution of sodium stannate 2½ lbs., water 87 quarts. Rinse and dye. Stannate of soda cannot be safely applied to goods containing wool or worsted; they seldom escape being more or less blackened by it.

(4) W. C. asks how pool or billiard balls are colored. A. Red: Soak for a few minutes in weak nitric acid, and then immerse in a strong infusion of cochineal in aqua-ammonia; or add ammonia water to strong solutions of magenta and picric acid (separate), and then mix the solutions. Black: Immerse the pieces in weak aqueous solution of silver nitrate for a short time, and then expose to sunlight; or steep for 2 or 3 days in a strong decoction of galls, 1 lb.; logwood, 2 lbs.; then steep for a few hours in a strong solution of iron acetate (iron liquor). Green: Dissolve verdigris in weak vinegar or very dilute nitric acid; a little sal-ammoniac may be added to this. Yellow: Steep for 24 hours in aqueous solution of acetate of lead, and after drying immerse in solution of potassium dichromate. Blue: Stain green, then dip in strong pearlash solution, or steep them for a short time in a weak solution of indigo carmine or sulphate of indigo, to which a little cream of tartar has been added. Purple: Steep in a weak aqueous solution of gold chloride.

(5) F. G. McC. writes: I am experimenting in electrotyping, but I don't succeed as I wish. I make a solution of sulphate of copper in one vessel, in which I place a sheet of copper. I use a one cell Daniell's battery. I join copper in the battery to copper in the solution, and the zinc pole of the battery to the wax matrix in the solution, and which has been covered with plumbago. The copper deposits in crystals; of course I cannot use it in that shape. Now what remains to be done? A. The current used is not strong enough; see that all the connections are tight and clean; bring the work closer to the copper anode, which should expose greater surface than the work; make the bath slightly acid; then increase your battery if necessary.

(6) J. M. L. asks how to dissolve shellac to make a varnish, other than using alcohol. A. Shellac dissolves in wood naphtha (methyl spirit), in strong hot solution of borax, and in strong aqua-ammonia; these solutions have been used as varnishes.

(7) P. A. S. asks for a recipe for a cement for mending leather belting, or for patching old boots, etc. A. (1) Melt together equal parts of pitch and gutta percha; apply hot with pressure. (2) Dissolve gutta percha in naphtha to the consistence of cream. See other recipes on this page.

(8) A. P. O. asks how to pack material similar to fine flour (dry) tight into barrels, without machinery. A. As we understand your meaning, we do not think it can be done, unless you can place a loose paper lining in the barrel and ram the material as the barrel is filled.

(9) J. E. L. asks: What will remove greasy substance that gathers on inside of sink pipes from dish water, etc.? A. Use occasionally a strong hot solution of caustic soda.

(10) J. L. asks for a recipe for making blacking that will raise a polish over oil or grease. A. Bone-black (best from sugar house filters, dried), 30 lbs.; sulphuric acid (commercial oil of vitriol), 2 quarts; strong malt vinegar, 3 quarts; mix and digest; then add, with constant stirring, coarse brown sugar, 11 lbs.; molasses (average New Orleans), 30 lbs.; sperm oil, 2 gallons; water, q. s. The ingredients must be well commingled by trituration, and allowed to act upon each other for several days before using.

(11) F. W. R. writes: What should be the resistance of the magnet wire of an electric engine, that is to be driven by the electric current, produced by a magneto-electric machine? A. The resistance of the magnet wire of each instrument should be about equal.

(12) E. A. asks for the cheapest method to melt horn, and what kind of moulds to use. A. Horn is softened by boiling water, and while soft may be moulded by heavy pressure. The moulds used are generally of zinc, bronze, steel or iron.

(13) J. F. C. desires to know the best cheap composition to heat and dip knives into to plate them bright, so that acid will not tarnish them. A. A bath of molten tin covered with tallow has been used.

(14) Y. & O. ask: How can we keep paste, made of flour with a little alum added, from souring? A. Add a small quantity of zinc chloride solution or a few drops of carbolic acid or oil of cloves.

The Scientific American EXPORT EDITION. PUBLISHED MONTHLY.

THE SCIENTIFIC AMERICAN Export Edition is a large and SPLENDID PERIODICAL, issued once a month, forming a complete and interesting Monthly Record of all Progress in Science and the Useful Arts throughout the World. Each number contains about ONE HUNDRED LARGE QUARTO PAGES, profusely illustrated, embracing:

(1.) Most of the plates and pages of the four preceding weekly issues of the SCIENTIFIC AMERICAN, with its SPLENDID ENGRAVINGS AND VALUABLE INFORMATION.

(2.) Commercial, Trade, and Manufacturing announcements of leading houses.

Terms for Export Edition, \$5.00 a year, sent prepaid to any part of the world. Single copies, 50 cents.

For sale at this office. To be had at all News and Book Stores throughout the country.

NOW READY.

SCIENTIFIC AMERICAN for June, 1878, with Eighty-eight Engravings.

GENERAL TABLE OF CONTENTS.

The Sponge Trade of the Bahamas; interesting particulars.

How America is Crowding England in the Supply of Foreign Markets.

Do Inventions Injure the Laborer? A valuable paper full of remarkable statistics showing what inventors have done and are doing for the benefit of workers.

Examples of Successful Meddlers in Arts in Which They are not Skilled.

The Importance of Our Internal Commerce.

Silk Industry at Home and Abroad.

California vs. Australian Wool.

A New Mint for Honduras.

The Chinese Sailor Question.

Narrow Gauge Railway to the West.

The Industrial Importance of Small Manufactures.

Successful Introduction of American Knit-goods in England.

Success of American Competition in the Manufacture of Cutlery.

How British Commerce Helps British Manufactures.

The Texas Live Cattle Trade.

Glass Making at Pittsburgh, Pa.

American Trade with Belgium.

American Carpet Production.

The Extension of American Commerce.

Progress and Prosperity of Barron, Eng.

American Productions Abroad.

American Trade with Brazil; Statistics of.

American Petroleum Exports.

Meat and Beer Sent to Europe.

American Exports and the Strikers in England.

The Industrial West.

Good Work from Cheap Patents.

Value of New Industries.

Statistics of American Exports.

Live Hogs for England.

Six Years' Progress in Steel Making.

American Silk Culture.

The Sugar We Use.

The Coffee We Drink.

American Leather in Europe.

American Stamping Mill for Peru.

How to Make a Market for Iron and Steel.

American Street Cars in Foreign Countries.

American Illustrated Advertising.

Our Iron Trade.

Wages in France.

The South as a Field for Manufactures.

Work for New York City.

American Workmanship as Seen in Foreign Countries.

Progress in Hard Times.

How to Set Steam Boilers; two figures.

New Mode of Equalizing the Wear of Pistons and Horizontal Engines.

Clearance and Compression; a concise explanation of these terms.

The Roberts Steam Engine and Boiler; two illustrations.

Important Facts Concerning Boiler Corrosion.

New Vertical Steam Engines and Boilers; two engravings.

The New Steam Launch Barrancas; one engraving.

Remarkable Locomotive Performances.

Horizontal Engine with Coleman's Valve Gear; with five illustrations.

Progress of the Great St. Gothard Tunnel.

Method of Connecting a Leading Screw—By Joshua Rose; two illustrations.

First Invention of the Iron Frame for Pianos.

A Japanese Bronze Factory.

A Razor Grinding Machine Wanted.

A Perpetually Moving Clock.

The Elevated Street Railways of New York City; with five excellent engravings.

Opening of the Metropolitan Elevated Railway.

Artificial Fuels; a description of the best methods now used.

Singular Effects of Carbon in a Blast Furnace.

Silver Mining in Massachusetts; being an interesting description of the present status of the great gold, silver, copper and lead mines at Newburyport, Mass.

Silver in the Arts; by Edwin C. Taylor.

The Extent and Methods of Counterfeiting Coins.

Asphalt Wood Pavements.

The London Water Works.

Fire Works, How Made; with illustrations, six figures.

Holcomb's Hot Air Furnace; one engraving.

The Mississippi Jetties.

The Problem of Unsinkable Ships.

Russian Steel Torpedo Boats; with five illustrations.

Crispin's Collapsing and Portable Boats; two engravings.

A Steel Steamer.

A New Plan of Warfare.

Characteristics of American Steam Fire Engines.

Driving Piles in Sand.

New Machine for Making Cigarettes; one engraving.

New Instrument for Testing Gold and Silver Coins; one engraving.

Stevens' New Vertical and Horizontal Vise; two illustrations.

Cummings' New Dustless Ash-Sifter; one engraving.

Andrews' Stovepipe Blower for Increasing the Draught of Stoves; one engraving.

Volle's New Mosquito Net Frame; three illustrations.

A Curious Perpetual Motion; one figure.

New Portable Blacksmith's Forge; two engravings.

Improved Signal Egg Boiler; one engraving.

Descriptions of the Most Interesting Recently Patented Mechanical and Agricultural Inventions.

Hydraulic Salt Mining in Bavaria.

History and General Description of Gas Engine Motors.

New Ether Ice Machine; one engraving.

Brush Making by Machinery; with six illustrations.

Noteman's Improved Rotary Force Pumps; three illustrations.

Manville's Improved Geared Shaper; one engraving.

New Single Arch Bridge Proposed for the Thames River, London; with one engraving.

New Automatic Knife Grinder; one engraving.

New Shoe Brush; one engraving.

New Lathe for Turning Spheres; four figures.

A New Wheel Tire.

Smith's Improved Wagon Jack; one engraving.

Graether's Improved Sled, two figures.

Lumgren's Improved Argand Lamp Burner; three figures.

New Ironing Table; one figure.

New Chain Pump; one figure.

The New Process of Flour Making.

Recipe for Making Fine Japanese Cement.

How Japanese Kaga Ware is made.

Adulterations of Soap.

Olive Oil Soap Manufacture.

Fibrin.

Catalpa Trees; remarkable durability of the wood; the various species and their culture.

Fence economies.

The Great Exhibition at Paris.

Exhibition Building at the Trocadero; one large engraving.

Steel Exhibits, by Jessop & Sons.

The Exhibit of American Glass Ball Casters; one engraving.

The International Avenue; one engraving.

Reapers and Mowers at the Paris Exhibition, by Edward H. Knight.

Carr's Improved Dredger; one engraving.

Firing Guns Under Water; experiments of Professor Mott.

Adams' Device for Cooking by Solar Heat; with one engraving.

Manufacture of Chloride of Lime.

Curious Experiments with Ozone.

The Newton Photo Process.

Amount of Sugar in Strawberries, Pineapples, Cherries, Currants, Beets, Cane, and other products.

Some Recent Facts about Common Poisons; Strychnine, Arsenic, Lead, Opium, Muscarin.

The Physiological Effects of Thirst.

New Remedy for Suppurating Wounds, by Dr. Waters.

The Electrical Gyroscope, by George M. Hopkins; with one large engraving, and description showing the construction and operation of this curious electrical instrument.

The Largest Electrotpe ever Made.

Notes on the Telephone, by L. S. Duerden; with one engraving.

A New Mouth Telegraph.

The Carbon Telephone; with five illustrations.

Edison's Micro-Tasimeter; with four illustrations.

Hughes' Microphone.

Interesting Electrical and Magnetic Experiments.

Production of Composite Portraits.

Remarkable Performances of the Phonograph.

Trouve's New Telephone Improvements.