

**New Mechanical Inventions.**

An ingenious Sounding Machine, by which the depth of water is quickly and accurately shown, has been invented by Mr. F. E. Schrom, of Whitewater, Wis. There is an endless graduated indicating belt, combined with the reel that carries the sounding line, to which a relatively low velocity is imparted in such a manner that equal lengths of the line, when winding upon or unwinding from the reel, are represented by much shorter distances moved by any point on the belt. The graduations on the latter are numbered to indicate fathoms and quarter fathoms on the line.

Mr. Daniel H. Merritt, of Marquette, Mich., has patented a new Friction Gearing, the improvement in which consists in making a triangular or V-shaped groove between the bases of the teeth, at a more acute angle than the latter. The teeth or ribs travel faster at the periphery than at the bases, and are consequently liable to the greatest wear at the outer portion of their surface. By the present arrangement, it is claimed that as the ribs wear away they will maintain their original form.

Mr. Lorenzo Meeker, of Oswego, N. Y., has invented a new Lifting Jack by which a heavy weight may be lifted either from the ground or from the top of the device. There is a combination of a vertically sliding bar, a peculiarly constructed clutching device, and a lever fulcrumed on the tubular standard, by which the vertically sliding bar is guided.

In a new Car Wheel patented by Messrs. H. Scheibel, Jr., George M. Seeley, and John Schneider, of Bridgeport, Conn., annular elastic packing is interposed between the cylindrical faces of the tire and the web, the object being to absorb the jar, deaden the sound, and diminish the force of concussion, thus affording a better riding wheel and reducing the wear on the tire.

Mr. L. Morgenthau, of New York city, has devised a new Paper-feeding Machine, which consists of a vertically reciprocating and oscillating casing or receptacle, that is arranged with a narrow longitudinal slot at the curved bottom, and filled with some adhesive substance for the purpose of taking up and lifting a sheet of material at the down stroke of the receptacle and carrying it by the up stroke and by contact with a top stop screw to the feed rolls, so as to be taken up by the same.

Mr. T. A. Blake, of New Haven, Conn., has recently devised a new Ore Crusher, the object being to secure a regular feed and the avoidance of sudden strains upon the frame or the rods of the machine. The materials to be crushed are broken to uniform size and placed in a hopper. A sliding cover is then adjusted to supply the required material to the rolls. The rotation of a roll beneath the hopper causes an even supply of material to fall from the latter to the crushing rolls, where it is reduced to a uniform powder, either coarse or fine, as may be desired. New devices are provided, so that under sudden strain the rolls are permitted to yield without the necessity of overcoming increased resistance.

Mr. Carl A. Schumacher, of Walla Walla, Washington Territory, has devised a new Sewing Machine Shuttle, one advantage of which is that the tension spring and its fastening are permanently attached to the shuttle case, and consequently none of the parts are likely to become mislaid or lost.

A new Cross Tie for railways devised by Mr. David Horrie, of Keokuk, Iowa, consists of a cast or wrought iron tie made of a broad bearing surface, center bottom rib, and with lateral top flanges, that bind on the base of the rails and firmly secure the same. With this are combined straight screw bolts, having spiked heads that pass in grooves of the tie across the bottom of the rails.

Mr. Clark P. Hayes, of Brooklyn, N. Y., has invented a Machine for Cutting and Grinding Logwood, which is intended to take the place of the separate machines now used for that purpose. It works rapidly and separates the fine particles from the coarse chips, which last are conducted away and reground.

Mr. Elson Towns, of Cisne, Ill., has devised a new Governor for Steam Engines, which is so contrived that the relation of the centrifugal force of the rotating balls to the resistance changes as the balls rise or fall; and the relation of the motion of the balls to that of the moving sleeve is also variable, so that the governor is most sensitive when sensitiveness is required.

**Business and Personal.**

*The Charge for Insertion under this head is One Dollar a line for each insertion.*

A Rare Opportunity.—A new Factory, with Engine, Boiler, Shafting, etc.; in a splendid location; suitable for manufacturing; will be sold for less than 1/4 of its original cost, or will be leased on easy terms. For particulars, address L. A. Lawton, Herkimer, N. Y.

Alcott, Mt. Holly, N. J., pledges power to equal any Turbine.

I want some patented article in Wood or Iron to manufacture. De Valois St. John, Leonardsville, N. Y.

Manufacturers of Water Motors address Wm. Morehouse, 1,023 Delaware Ave., Buffalo, N. Y.

Everybody their own Nickel Plater; no battery. Send 3c. stamp for particulars to Wm. Munch & Co., Groton, Tompkins Co., N. Y.

For Sale.—Machinery and Compositions of all kinds of Matches. Apply to J. H., P. O. Box 942, N. Y. city.

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

Canadian Patent For Sale.—Mey's Dryer for Grain, Malt, etc., has been in practical use for several years in Buffalo, N. Y. Address F. H. C. Mey, Buffalo, N. Y.

Galvanized Iron Cornice Machines.—The most improved, Straight and Circular. Prices reduced. Calvin Carr, Cleveland, O., and Hewes Machine Works, Newark, N. J.

For a 15 in. Swing Lathe having 1 1/2 in. hole through Head Spindle, something new, address Star Tool Company, Providence, R. I.

For New Illustrated Catalogue of Foot Lathes, Scroll Saws, Small Steam Engines and Amateur's Tools, send stamp to Chase & Woodman, Newark, N. J.

Mechanics, Builders, Architects, and Plumbers, send for specimens of Manuf. and Builder, 87 Park Row, N. Y.

Carpenters.—Your Saws will cut straight by using my Jointer; the teeth will all be of an equal length. Sample by mail, 25 cts.; \$2 per doz. E. Roth, New Oxford, Pa. I want agents.

For the best and most practicable Brick Making Machine, address Chambers Bros. & Co., Philadelphia, Pa.

For power and durability, Alcott's Water Wheel, Mt. Holly, N. J.

2d Hand Iron Planer built by Smith of Salem, Plane 13 ft. x 30 in.; price \$375. A. C. Stebbins, Worcester, Mass. Cornice Brakes. J. M. Robinson & Co., Cincinnati, O.

Noise-Quitting Nozzles for Locomotives, Steamboats, etc. T. Shaw, 915 Ridge Ave., Philadelphia, Pa.

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

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

John T. Noye & Son, Buffalo, N. Y., are Manufacturers of Burr Mill Stones and Flour Mill Machinery of all kinds, and dealers in Dufour & Co.'s Bolting Cloth. Send for large illustrated catalogue.

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

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.

Steel Castings from one lb. to five thousand lbs. Invaluable for strength and durability. Circulars free. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

For Best Presses, Dies, and Fruit Can Tools, Bliss & Williams, cor. of Plymouth and Jay Sts., Brooklyn, 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.

Shaw's Mercury Gauges, U. S. Standard of Pressure, 915 Ridge Ave., Philadelphia, Pa.

New Machinery at Second-hand Prices.—Two Brown & Sharp's No. 3 Screw Machines; Five Prentice Hand and Foot Lathes; Six Boiler Feed Pumps; detailed list free. E. I. N. Howell, 720 Filbert St., Philadelphia, Pa.

Friction Clutches warranted to save Rolling Mill Machinery from breaking. Also Hoisting Machines and Safety Elevators. D. Frisbie & Co., New Haven, Conn.

For Sale.—An Elevator, with Carriage, suitable for a Hotel. Apply to Morgan & Co., 154 South 4th St., Philadelphia, Pa.

Polishing Supplies of all kinds. Walrus Leather Wheels, all sizes and shapes. Greene, Tweed & Co., N. Y.

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

Felt of every description for Manufacturers' purposes, especially adapted for Polishing, can be furnished in any thickness, size, or shape. Tinguo, House & Co. Manufacturers. Salesroom, 69 Duane St., N. Y. Factory at Glenville, Conn.

Ice Machines. Clayton & Cook, Daretown, N. J.

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

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

Vertical Scientific Grain Mills. A. W. Straub & Co., Phila.

Fine Taps and Dies for Jeweler's, Dentist's, and Machinist's use, in cases. Pratt & Whitney, Hartford, Ct.

Weldless Cold-drawn Steel Boiler and Hydraulic Tubes. Leng & Ogden, 212 Pearl St., N. Y.

Safety Linen Hose for factories, hotels, and stores, at lowest rates. Greene, Tweed & Co., 18 Park Place, N. Y.

Diamond Tools. J. Dickinson, 64 Nassau St., N. Y.

The best Turbine Water Wheel in use. Alcott, Mt. Holly, N. J.

Manufacturers should try the pure natural Lubricating oil. Produced and prepared by Geo. Allen, 18th street, Franklin, Pa. It does not gum or chill in cold weather, and wears as well as lard oil. Price by the barrel 30 cents per gallon. Packages of 10 gallons sent on receipt of \$3.75.

More than twelve thousand crank shafts made by Chester Steel Castings Co. now running; 8 years' constant use proves them stronger and more durable than wrought iron. See advertisement, page 73.

**NEW BOOKS AND PUBLICATIONS.**

UPLAND GAME BIRDS AND WATER FOWL OF THE UNITED STATES. By A. POPE, JR. Published by Scribner, Armstrong & Co., 743 and 745 Broadway, New York city.

We have received the first part of one of the most elegant ornithological works that has been published since Audubon produced his colossal volumes. The idea is to present a series of exact illustrations of many of the principal game birds and water fowl of the United States, drawn from and colored to the life by an artist sportsman who has studied them for years, and whose ability as a painter in water colors is of high order. The sketches, which are reproduced in fac-simile in the highest style of chromo-lithographic art, represent the male and female of each variety of birds, and the descriptive text is taken from Wilson's, Audubon's, Baird's, Cope's, and other standard ornithological books. The entire work is being published in the most unassuming manner, and when complete will form one of the handsomest productions of a publishing house already renowned for the artistic excellence of what it puts forth. The part before us relates to the American Snipe and the Green Winged Teal. The four following parts—there are to be five in all—describe the woodcock, mallard duck, quail, black duck, ruffed grouse, blue billed duck, prairie chicken, and red headed duck. The work is sold by subscription only, at \$2.50 per part.

AMES' COMPENDIUM OF PRACTICAL AND ORNAMENTAL PENMANSHIP. By Daniel T. Ames. Published by A. J. Bicknell & Co., 27 Warren St., New York. Price, cloth, \$5.

This is a large quarto volume containing 46 plates, finely executed by photo-lithography, and placing before the penman a great variety of models for imitation, ranging from simple elements of letter formation to the most elaborate engraving. Twenty ornamental alphabets (many entirely new) are embodied, besides numerous designs for borders, monograms, and the various formal documents, such as resolutions, testimonials, etc., in preparing which the penman's skill finds its crucial test. The author states that it is the most complete handbook of ornamental penmanship extant. It is very handsomely published.

PALLISER'S AMERICAN COTTAGE HOMES. Published by A. J. Bicknell & Co., 27 Warren St., New York. Price \$5.

The above-named publishing house is doing valuable service in its frequent publication of copiously illustrated works containing designs for dwellings which are not only moderate in price but in accordance with a constantly improving popular artistic taste. American village architecture has long been remarkable for lack of beauty, chiefly perhaps on account of the rapidity with which new towns spring up in this country, and the necessity of building at low cost. Now that the best architects do not think the planning of a workman's cottage unworthy of their skill, we may look for the application of better principles both in construction and exterior appearance. The present work is a notable instance of what may be done toward adapting really tasteful and new designs to the exigencies of moderate outlay. Here are 50 designs, each giving the necessary plans, elevations, and perspectives of cottages, none costing more than \$3,500 to erect complete, and ranging from that figure down to as low as \$325 for a very neat 2 room 1 1/2 story dwelling. All are tasteful, many picturesque and elegant. They are intended for the country and look rural, which is much more than can be said of the ineffectual attempts to imitate French city architecture on a reduced scale, which of late years many architects have made, in planning country homes. Full forms of specifications and agreements are given, so that the reader has only to select his design and make a contract with a builder to have it constructed.

PRACTICAL STUDIES IN LINEAL DRAWING. Designed and engraved by E. Becker. Price 75 cents. For sale by the author, Box 140, Stapleton, Staten Island, N. Y.

This is a portfolio of six finely engraved plates, exhibiting mouldings, volutes, and pedestals, and the Tuscan, Ionic, Doric, Corinthian, and Composite orders of architecture. Problems and solutions and various explanations are engraved upon the plates.



(1) C. L. asks: Is there any way to prevent a lignum vitæ block from checking? I have a piece that I use for cutting stencil plates on, and it has begun to check quite badly. I should like to prevent it without injuring the wood. A. Oil would have a tendency to stop it if frequently applied. A coat of paraffin would close the pores and prevent the action of the air upon the fibers. It might be bound with an iron ferule.

(2) F. B. asks what papier mache is composed of for making ornaments, also how to mix it for casting. A. It is a mixture of paper pulp and hot melted glue; the mixture is poured or cast while hot in moulds which may be made of plaster of Paris, and as soon as it sets by cooling is removed from the mould, and allowed to dry by exposure to the air; and when dry it is varnished or polished, according to the degree of finish that is required.

(3) S. A. H. writes: Please inform me how screw taps are hardened; those we have with the dies are a reddish color, and stand quite well, but we cannot make any that will stand that color. A. It may be that you harden at too high a heat. Sprinkle pulverized yellow prussiate of potash over your taps. When they are heated to a dull red, again place them in the fire and increase the heat for a few moments until the prussiate is thoroughly fused or fluxed over the surface, and then immediately plunge and shake them (so that they will chill quickly) into and under clear cold water. When thoroughly cool, the tap or taps are to be

removed from the water, then cleaned, polished, oiled, and tempered.

How are those collapsible tubes made used to put artists' oil colors up in? A. On very much the same principle as lead pipes are made—the metal is heated and drawn (in dies) to the required shape by pressure.

1. I have a Daniell battery (zinc was cast from chain pump buttons). It will not work sometimes for a long time, and then very weak. I would like to know the reason? A. It is likely that your battery zinc contains lead. 2. Can the sulphate of copper solution be made so strong as to impair the action of the battery? A. Not in Daniell's form of battery.

(4) J. L. P. says: In the SCIENTIFIC AMERICAN of December 15, 1877, under "Notes and Queries," is the following by H. R. H. (16): "What is the correct answer to the following example?  $714 - 714 \div (34 - 034 \times 25 \div 6)$ ." There were two answers given, 1554 and 71152942+. In your answer you say the second solution is the correct one. I claim the first (1554) to be the correct answer, and give my reasons below. A. The statement is ambiguous; it may be rendered in four different ways, thus: 1.  $(714 - 714) \div [(34 - 034) \times 25 \div 6] = 1554$ . 2.  $(714 - 714) \div [34 - (034 \times 25 \div 6)] = 2468 \cdot 117$ . 3.  $714 - [714 \div (34 - 034) \times 25 \div 6] = 712444$ . 4.  $714 - [714 \div (34 - (034 \times 25 \div 6))] = 711529$ . In the quotient, the decimals are carried out to only the third place.

(5) M. H. R. says: It is desired to deaden the floor in a schoolroom. The room is about 45 x 30, the ceiling underneath is of 1/2 inch boards. What would be the best and cheapest mode of doing it? A. Lay down two or three thicknesses of building paper under the floor plank.

(6) A. S. asks: How are blue photographic pictures made? A. First solution: Potassium ferrocyanide, 120 grains; water, 2 ozs. Second solution: Ammonium ferric citrate, 2 ozs.; water, 140 grains. Mix the separately made solutions, filter into a flat dish and float plain photographic paper on it for 3 or 4 minutes. Dry the paper in the dark and expose it to strong sunlight under the negative for 8 or 10 minutes. Wash the print in running water, dry, and mount. A little gum arabic in the bath is said to greatly improve the picture.

(7) J. M. S. asks: What are the coloring matters used by confectioners—red, blue, yellow, and green? A. Blue: Indigo powder, soluble indigo (sulph-indigotic acid), Prussian lake. Yellow: Saffron, Turkey and Persian yellow berries, quercitron, fustic, and aluminous lakes of these. Mixtures of blue and yellow make green. Red: Cochineal, carmine or lake, Brazil wood lake, madder lake. Carmine is often adulterated with vermilion (mercury sulphide); it should, if pure, dissolve without residue in strong aqua-ammonia.

(8) A. H. J. writes: Can you inform me how I can obviate the following difficulty with my cook stove? A thick, black, tarry substance almost continually oozes through the joints of the pipe and drips onto the stove and carpet, and has a strong, disagreeable odor. The draft is good; the wood used is beech and maple, thoroughly seasoned. The pipe is nearly new and perfect, about 16 feet in length from stove to chimney, with only one elbow. The stove, with this exception, is an excellent one. A. The tarry substance you mention is a product resulting from the destructive distillation of wood, and consists principally of pyrolygneous acid. Your stovepipe acts as a condensing worm to a still or retort, such as is used in chemical manipulations; in fact, you are making pyrolygneous acid; but as you seem to take no interest or pleasure in this manufacture, we suggest as a means of preventing it that you connect your stove directly with a brick chimney, so as to use as little metal stovepipe as possible.

(9) F. H. S. asks for a good indelible ink to use with stamps? A. Mix equal parts black oxide of manganese and hydrate of potash, heat to redness, and rub with an equal quantity of smooth white clay into a paste, water being added for that purpose; or, sulphate of manganese, 2 drachms; lampblack, 1 drachm; powdered loaf sugar, 4 drachms; rubbed into a paste with water. After stamping, dry the linen and wash well in water. Mix aniline red or rubine extra, 2 to 4 drachms; alcohol and water, each 7 ozs.; glycerin, 15 ozs.; heat and rub together with a little tannic acid or sumac extract and alum water. For blue, use soluble water blue (aniline) dissolved in a sufficient quantity (about 150 parts) of hot dilute glycerin. Soluble nigrosine may in a similar manner be used for blackink.

(10) F. W. M. asks how to hold India ink in solution like that prepared by Winsor & Newton? A. The ingredients are digested for two hours at a high temperature in a Papin's digester. A drop of clove oil should be added and a little ox-gall.

(11) J. V. asks: What is the feeding principle of the German students' lamp? A. The equilibrium of a liquid in communicating vessels. Consult some text-book on Natural Philosophy.

Will ordinary rubber bands answer for making a coating or cement by dissolving in bisulphide of carbon? A. No; use gum rubber or caoutchouc.

1. What is the cheapest manufacture of ammonia? A. By decomposing the solution of the sulphate or carbonate obtained from the liquor of gas works, by slaked lime aided by heat. 2. About what is the cost of manufacture per lb.? A. If you refer to aqua or liquor of ammonia, crude, 10 cents; chemically pure, 75 cents.

(12) D. S. asks: Is there any method of keeping the worm out of white hickory? A. The application of a dilute solution of tannin mixed with about 10 percent of zincchloride is said to preserve the wood to some extent.

(13) J. S. asks: Is it practicable to manufacture ice by utilizing the cold given out by the expansion of compressed air (say to five atmospheres)? A. Yes, but the processes involving ether, anhydrous sulphurous oxide and other chemicals are more economical.

(14) S. S. asks: What can be added to common black writing ink to make it a copying ink? A. A little loaf sugar dissolved by heat.

(15) G. F. and others ask for recipes for permanent black, blue, and red inks that will not mould? A. Bruised Aleppo nutgalls, 12 lbs.; water, 6 gallons; boil in a copper vessel for an hour, adding water to make up for the portion lost by evaporation; strain, and again boil the galls with four gallons water for half an hour, strain, and boil a third time with 2 1/2 gallons, and strain. Mix the several liquors, and, while hot, add green vitriol (copperas) coarsely powdered, 4 lbs.; gum arabic, powdered, 3 1/2 lbs. Agitate until dissolved, and after setting strain through a hair sieve. Product 12 gallons very fine and durable. Sumac, logwood, oak, and hemlock bark are frequently substituted for galls in the preparation of common ink. When such is the case, only one sixth or one seventh of their weight of copperas should be employed. A few drops of creosote will prevent mould. A very bright blue ink is made by dissolving laundry blue in a sufficient quantity of hot water; or mix, by grinding into a paste with water 20 parts of finest Prussian blue and 3 parts yellow prussiate of potassa, and dilute sufficiently with water, to which a little gum may be added. Or use Hoffmann blue 3 B, dissolved in 300 parts of water. Red: Pure carmine, 12 grains; aqua-ammonia, 3 ozs.; dissolve, then add powdered gum, 18 grains. Drop lake is generally used in place of the more costly carmine; use 1/2 drachm as above. Or use "rubine extra" dissolved in 150 parts of water.

(16) J. N. asks: What ink is used by book-binders for printing the covers of books in black? A. Ordinary printing ink.

(17) F. F. asks how dextrin is prepared? A. Mix a grain or two of starch with about three spoonfuls of cold water and a drop or two of sulphuric acid, and boil the mixture for a few minutes. When sufficiently boiled, a drop of the solution should no longer be colored blue by iodine solution. Agitate the liquid with a little chalk to remove the acid, filter and evaporate to dryness. The product is dextrin. A similar conversion is produced by boiling with malt. Dextrin or British gum is produced commercially by heating dry starch to about 320° Fahr. in revolving sheet iron cylinders and grinding to flour the hard yellowish product.

(18) A. H. asks: How can I temper American tool steel after welding it in a piece of iron so it will do for cold chisels? I have tried it different ways, but it gets so brittle it will not stand. I wish to manufacture knives for straw cutters, welding steel on iron, and draw it out. What is the best steel to use for that purpose? A. If you use chrome steel you will find no difficulty.

(19) L. N. says: I wish to make a flask 18 by 6 inches, to hold liquid carbonic acid. Of what thickness ought the iron to be? A. Vessels of this kind are made of cast bronze an inch in thickness. 2. What would be the weight of such a flask made of the safest material? A. About 90 lbs. 3. How many lbs. would it hold? A. It would contain about 5 1/2 of the liquid oxide. 4. In 1 lb. of liquid how many cubic feet of gas? A. About 8 1/2 at the ordinary temperature.

(20) A. S. C. asks how to produce a thin enamel or skin upon paper board that will dry quickly, without penetrating, and give additional strength, and at the same time be porous and indestructible, or as nearly so as possible, to fire at ordinary heat? A. You may try strongest solution of water glass, made white hot into a thick paste with siliceous earth—trippol, rottenstone, etc., powdered felspar or kaolin.

(21) X. X. X. asks how to mix the best solder that can be made for soldering brass to iron and iron to iron? A. Mix equal quantities of tin and lead. I want about 3,500 turns on a foot lathe; would you run a countershaft in centers or in bearings to get that speed? A. In bearings; centers would give too much trouble, requiring so much lubrication.

(22) W. E. G. writes: I wish to make a pair of experimental telephones, to work on a short line. Will the following materials answer the purpose? I have a pair of round steel bar magnets; each is 6 1/2 inches long by 7/8 inch in diameter; also 1 oz. No. 40 silk covered copper wire, and two thin iron plates (1/16 of an inch thick). Is anything else necessary? A. You have all the requirements for a pair of instruments described in our issue of October 6, 1877. You will, of course, find it necessary to use some form of sounding box in which to set the membrane or diaphragm. 2. I have seen it stated that there is a piece of soft iron attached to the magnet at the end next the diaphragm, and the wire is wound round this. Is this piece of iron necessary, and if not, is it an advantage? At it is not necessary, and in the style of instrument you describe it does not appear to us as an improvement.

(23) C. E. R. asks whether nickel plating a brass musical instrument injures its tone in the least? A. Yes, although the injury might not be noticed except by those whose sense of hearing is very sensitive. We believe the sweetest-toned instruments are made of wrought silver.

(24) C. M. L. asks how aniline inks are made? A. Red—Use "rubine extra" or aurin, dissolved in 150 parts of water. Blue-violet—methyl-violet 5 B, Hoffmann violet 3 B, or gentian-violet B, dissolved in 300 parts of water. Blue—water-blue BR, 5B, or 2B in 200 parts water. Green—methyl-green (crystals) in 100 parts water. Blue-black—aniline-gray in 200 parts water. Black—soluble nigrosine in 200 parts water. The color in each case is dissolved in the quantity of boiling water mentioned, and filtered. The addition of gum is not necessary. If the writing when dry retains a bronzy appearance, more water must be added to the ink.

(25) S. T. writes: I wish to know if an electrical cylinder, made as follows, will answer for the purpose in the experiment called "Leyden Jar Discharge," described in SUPPLEMENT 105, Jan. 5. Two well seasoned uprights, paraffined between which swings, on an axis running clear through, a bottle 12 inches diameter, 24 inches long, including the neck. The axis of the cylinder has a small pulley geared by cord to one 4 times its diameter. The uprights are glued into a well seasoned walnut base. I propose to apply the silk flap, as follows: A rod running from support to support

will have a piece of silk of sufficient length to hang over both sides of cylinder tacked in the middle to the rod mentioned above. Is this right? A. Yes, but instead of fastening the silk flap of your frictional machine to the wooden rod between the supports, it would be better to fasten it by means of silk thread to the friction pad or rubber, so that the silk thread will be the only electric communication between the flap and the rubber. With the size of machine you mention, the silk flap should be 18 inches wide.

(26) G. E. S. says: I am using tin to mould small articles. What can I do to have them come from the mould bright? A. Try an application of tallow as soon as the mould is cast.

(27) W. F. C. S. will find full description of steel tools for turning chilled rods in the SCIENTIFIC AMERICAN SUPPLEMENT of September 2, 1876. They are hardened as hard as fire and water will make them. Any stiff solid engine lathe will answer.

(28) T. & Bros. say: How can we keep iron cylinders from rusting? We do not want to put any grease on them, and we find that rust will come through nickel plating. A. Give them a coat of lacquer.

(29) W. B. H. asks for the best process known for tempering mainsprings for gun locks, also the best steel for that purpose? A. The blazing process is generally considered the best. Use spring steel or English double shear steel.

(30) F. A. P. says: I am casting plates of irregular form, and I want to run the metal on chill. Thus far I have failed; the plate always cracks and wrinkles in cooling. A. Your chill was probably not thick enough. To prevent cracking, the cooling must be made to take place equally at all parts.

(31) W. Y. asks how to temper millpicks? A. Heat them to a low red heat in a charcoal fire, turning them over and over to heat evenly; dip in water with the chill off, and temper to a clear brown color.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

J. S.—No. 1 is bornblende schist. No. 2 is a variety of bituminous coal. No. 3 is orthoclase. No. 4 is calc-spar.—S. B.—It is chlorite-hydrous silicate of monesite and alumina colored with oxides of chromium and iron. Not metalliferous.—M. F. B. (drab box).—Argillaceous limestone containing iron sulphide and arsenide, and probably a trace of copper and lead sulphides. Silver was not detected.—E. G.—It is a brown coal containing more ash, moisture, and oxygen than that used on the Mississippi. By distillation it will yield a gas and several oils; it is a good fuel.—Blue box, unlabeled.—Four samples of rich lead sulphide ore (salena). Nos. 2 and 3 are argentiferous and contain copper.—A. B. K.—No. 1 is argentiferous galenite in a calcareous slate gangue. An assay would be necessary to determine its value—it is valuable. Nos. 2 and 3 similar to No. 1. No. 4 is earthy celestite—strontium sulphate.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges with much pleasure, the receipt of original papers and contributions upon the following subjects:

- On a Standard of Beauty. By J. F. G. M.
On Gas Poisoning. By J. K.
On Making Wooden Pulleys. By B. T. D.

HINTS TO CORRESPONDENTS.

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 fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Inquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

WANTS AND BUSINESS INQUIRIES.

Almost any desired information, and that of a business nature especially, can be expeditiously obtained by advertising in the column of "Business and Personal," which is set apart for that purpose subject to the charge mentioned at its head.

We have received this week the following inquiries, particulars, etc., regarding which can probably be elicited from the writers by the insertion of a small advertisement in the column specified, by parties able to supply their wants:

- Who makes the Stoner & Whepley mill?
Who makes a good self-governing windmill for driving machinery?
Where can zirconium be bought, and at what price?
Who moulds sawdust into picture frames?
Who makes electrical batteries for gas lighting?

OFFICIAL.

INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending December 18, 1877, AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A complete copy of any patent in the annexed list, including both the specifications and drawings, will be furnished from this office for one dollar. In ordering, please state the number and date of the patent desired, and remit to Munn & Co., 37 Park Row, New York city.

- Abdominal supporter, Gray & Foster 198,326
Air, moistening, C. R. Merrill 198,328
Animal trap, S. McBride 198,246
Bale ties, instrument for opening, C. Lester 198,398
Band cutting implement, wire, C. B. Withington 198,442
Bark from wood, machine for removing, I. Winn 198,327
Barrels, machine for setting up, C. O. Appleby 198,330

- Bars and tires, machine for, H. Ross, Sr. 198,216
Basket, A. Fox 198,289
Bed bottom, F. C. Bartlett 198,385
Bed bottom, A. D. Cooke 198,189
Bed bottom, spring, S. P. Smith 198,423
Bed lounge, F. Jensen 198,301
Bedsteads, clothes clamp for, F. Woodward 198,443
Bee hive, J. M. Shuck 198,223
Boats, coal tipple for loading, J. O'Hanlon 198,388
Boilers, transmitting steam from, O. Gebauer 198,373
Book clamp, W. C. Watson 198,437
Boot and shoe, D. H. Murphy 198,249
Boot and shoe edge trimmer, J. E. Young 198,234
Boots and shoes, stay for seams of, A. Seaver 198,220
Boring machines, bit clamp for, F. Dezendorf 198,280
Box iron, J. G. Ruger 198,314
Braid packages, clamp for, D. & D. L. Goff 198,375
Braiding machine, E. Whelan 198,230
Braiding machines, gear for, J. Keleher, Jr. 198,244
Brake, automatic wagon, H. Hunt 198,389
Brake shoe holder, B. E. Atwood 198,381
Brick compound, fire, Evans & Prescott 198,284
Brick molds, machine for sanding, B. F. Hewes 198,385
Brick, etc., oven for drying, J. K. Caldwell 198,347
Burglar alarm, M. S. Bolt 198,337
Butter, purifying rancid, R. W. Barnard 198,334
Button fastening, C. M. Underwood 198,323
Cake cutter, C. F. Schell, Jr. 198,219
Cake turner, J. Kelly 198,245
Can opener, J. McWilliams 198,206
Can, sheet metal, E. A. Leland 198,305, 198,306
Can tops, die for cutting, Kearns & Jensen 198,201
Capstan, power, Manton & Remington [r] 8,001
Car coupling, J. Chapman 198,349
Car coupling, G. W. Livick 198,399
Car coupling, J. Ramsey, Jr. 198,415
Car coupling, Stevenson & Swan 198,318
Car door, Miller & Susemihl 198,408
Car replacer, M. Waters 198,326
Car roof, H. Aldridge 198,177
Car roof, J. C. Wauds [r] 7,998, 7,999
Carbonating beverages, J. Matthews 198,403
Carbureter, W. F. Bossert 198,270
Carbureters, regulator for, B. E. Chollar 198,353
Card, playing, C. W. Saladee 198,217
Carriage spring, A. Woerber 198,259
Carriage top, J. V. Emmitt 198,194
Carriage top iron, C. J. Brackebush 198,184
Cart for heating plastic compositions, A. Dietz 198,356
Caster, furniture, C. Brinton 198,186
Casters, attachment for, L. B. Barker 198,184
Centrifugal machine, W. Cairns 198,346
Chain links, machine, Schinneller & Fitzpatrick 198,417
Chair, H. Heywood 198,386
Chair, E. J. Smith 198,421
Chair folding, G. McAleer [r] 8,004
Chair folding, D. N. Selleg 198,418
Chimney cap, G. Chase 198,359
Churn, M. K. Duty 198,363
Cider mill, Z. Thoman 198,226
Clocks, pendulum regulator for, H. C. Jacot 198,390
Clocks, winding alarm for, L. P. Bergstrom 198,268
Cogs, machine for cutting wooden, W. L. Morris 198,309
Compositor's stand, R. N. Patterson 198,310
Condenser, coiled tubular, P. S. Forbes 198,288
Cooking apparatus, J. G. Smith 198,316
Cooking, steam, Post & Furbush 198,212
Corn sheller, A. E. Lake 198,397
Corset, H. M. Chapman 198,348
Corset clasp, J. H. Bongartz 198,269
Cosmetics, tube for holding, J. N. Petingale 198,210
Cotton chopper, S. N. Camp 198,274
Cow's bag protector, M. R. Dowlin 198,282
Cradle or crib, swinging, J. McNeal 198,405
Cultivator, Ludlow & Pruitt 198,204
Cultivator and planter, cotton, M. T. Skinner 198,254
Cultivator and seeding machine, C. O. Gardiner 198,372
Cultivator, rotary, Breeden & Wheeler 198,339
Cuspadore, E. A. Heath 198,199
Cuspadore for cars, Burr & Towers 198,273
Cylinders, boring wood, C. Buckley 198,344
Dampers, controlling, Brandrig & Simmerman 198,185
Disintegrating cereals, process, R. d'Heureuse 198,192
Electric light, W. Wallace 198,436
Elevator, windlass water, T. B. Barber 198,263
Engine, D. Stanton 198,427
Envelope, L. Harsh 198,296
Fabrics, manufacture of ornamental, P. A. Dailey 198,358
Faucet, G. F. Fogarty 198,286
Faucet or cock, I. Simmons 198,253
Feed water heater, J. C. Stead 198,428
Felt, manufacture of articles of, A. P. Dailey 198,357
Felt skirts, making ornamental, P. A. Dailey 198,356
Fifth wheel for vehicles, I. W. Mead 198,407
Fire alarm and gas interceptor, A. A. Frecot 198,371
Fire arm, revolving, Wesson & Bullard 198,328
Fire arms, rear sight for, A. T. Decker 198,279
Fire arms, sight for, G. L. Winship 198,231
Fire boxes, crown sheet for, H. S. Bryan 198,342
Flock cutting machine, E. D. & A. S. Wilcox 198,440
Fly trap, portable, F. F. Thedens 198,235
Foot power machine, G. W. Brown 198,272
Forge, H. H. Hoff 198,337
Fork for pickles, etc., S. Poole 198,313
Fruit dryer, H. B. Smith 198,422
Fruit jar cover, W. G. Whitman 198,429
Furnace condensing mercury, Evans & Prescott 198,283
Furniture, school, M. W. Chase 198,362
Gas apparatus, T. R. White 198,438
Gas apparatus for generating, C. G. Brewer 198,340
Gas brackets, stop for swing, E. Langerfeld 198,374
Gases, destroying sewer, S. J. Corbett 198,277
Gate, J. U. Flester 198,369
Grain drill, P. W. & H. G. Briggs 198,271
Grain drills, spring hoe for, E. F. Stoddard 198,319, 198,320
Grasshopper catcher, M. H. Simpson 198,420
Gun barrel, W. H. Baker 198,333
Guns, shifting mechanism, D. W. Farrington 198,366
Guns, cartridge feeder, D. W. Farrington 198,368
Guns, traverse mechanism, D. W. Farrington 198,367
Harrow, J. E. Marshall 198,401
Hats, putting in, C. F. Bosworth 198,338
Hats, etc., machine for napping, W. E. Gowdy 198,377
Ray and cotton press, Schuck & Wildman 198,224
Hay press, I. R. Kulp 198,396
Hay rake and loader, A. T. Dora 198,281
Hay rake, horse, W. Adriance 198,328
Hay rake, horse, S. D. Bates 198,336
Hay tedder tooth attachment, J. Mudgett 198,410
Heater for desks and seats, M. W. Chase 198,351
Horse collar and hames, H. W. Thomson 198,227
Horse collar attachment, L. Deming 198,191
Horseshoe, Semt & Lorch 198,419
Horseshoe nail machine, J. A. Huggett (r) 8,003
Hose coupling, W. W. Marsden 198,402
Hub clamping, G. H. Clemens 198,188
Illuminating apparatus, H. A. Clum 198,276
Insect powders, distributor, A. M. Ellsworth 198,361
Ironing table, A. Aitken 198,262
Jewelry, manufacture of cabinet, W. A. L. Miller 198,207
Knife cleaner, J. T. Cronin 198,278
Knives to handle, attaching, G. S. Hastings (r) 8,000

- Lamp, C. F. A. Hinrichs 198,800
Lamp, Squire & Little 198,425
Lamp, W. H. H. Stineman 198,430
Lath holder, B. W. Hoyt 198,688
Lathe, metal turning, J. W. Post 198,211
Leaf, metallic, A. E. Outerbridge, Jr. 198,209
Level, O. Pickering 198,311
Life boat, C. E. Beaumont 198,267
Live stock register, P. Lytleton 198,307
Locks, arbor for safe, H. Urban 198,324
Locomotive, traction, J. Batley 198,266
Looms, mechanism for, L. J. Knowles 198,202, 198,203
Meat, machine for chopping, J. Steigert (r) 8,002
Meat holder, S. Poole (r) 7,995
Mechanical movement, G. Sanford 198,416
Milk, A. A. Durand 198,362
Nut lock, A. D. Rock 198,251
Operaglass, J. A. Finch 198,195
Ore separator, S. Stutz 198,432
Ores, roasting, I. M. Phelps 198,413
Overalls, H. S. Flood 198,237
Overalls, G. C. Henning 198,299
Pail and lantern, dinner, J. Haight 198,294
Paper bag, C. E. Sawyer 198,213
Paper collar machine, C. Spofford 198,421
Paper embossing machine, G. P. Drummond 198,241
Paper fastener, J. G. Johnston 198,200
Paper, parchment, T. & T. S. Hanna 198,382
Paper, etc., waterproof surface, C. W. Sharpless 198,222
Paper pulp, grinding wood for, J. H. Burghardt 198,226
Paper vessel, P. M. Aulbaugh 198,332
Passenger recorder, W. B. Sylvester 198,434
Pavement, concrete, Skinner & Bonnet (r) 7,996, 7,997
Pavements, composition for, N. B. Abbott 198,260
Peat-compressing machine, D. Townsend 198,256
Pipe coupling and joint, E. T. Steen 198,317
Piston, lubricating, H. A. Jamieson 198,391
Plane, bench, H. Baecker 198,130
Planter, corn, J. W. Allison 198,239
Planters, self-dropping for corn, M. Ackerman 198,251
Platform or mat, non-conducting, H. L. Palmer 198,412
Plow and cultivator, gang, C. Domschke 198,193
Plow, clevis, spring, J. F. Chase 198,275
Plow, gang, M. S. Curtiss 198,190
Polishing vegetable fiber, etc., G. & T. Shaw 198,315
Postal card, double, C. A. L. Totten 198,322
Pressure jack, hydraulic, S. A. Alexander 198,176
Printing, etc., machine, rotary, G. P. Drummond 198,239
Printing surfaces, G. P. Drummond 198,240
Printing surfaces, producing, G. P. Drummond 198,237
Pulley block, E. Y. Moore 198,247
Punch, conductor's, R. H. Moran 198,409
Railroad speed indicator, W. W. Wythe 198,233
Railroad switch, W. Wharton, Jr. 198,229
Railroad track, J. Foster 198,370
Railway crossing, E. H. Johnston 198,393
Railway rail chair, Driver & Smith 198,360
Railway switch, J. J. Golden 198,197
Rein holder, E. B. Guild 198,390
Roofing tile, P. Pointon 198,414
Salt cellar and napkin holder, T. R. Timby 198,435
Sash balance, J. C. Anderson 198,179
Sash fastener, B. Bush 198,345
Sash fastener, R. H. & G. H. Randall 198,250
Saw mill guide, F. A. & C. W. Olds 198,208
Sawing machine, scroll, N. Stafford 198,426
Scales, device for weighing, F. Fairbanks 198,365
Scarf, C. Loeb 198,400
Scissors and shears, L. Harsh 198,297
Screw, Jack, W. Guthrie 198,292
Sewing machine, revolving hook, J. Tripp 198,257
Shaft hanger, O. Cooley 198,354
Shaving mug, J. W. Smith 198,225
Shearing machine, N. L. Kink 198,308
Ship building, A. Muhleisen 198,248
Singletree, T. G. Bass 198,265
Smoking tube, W. Brisbane 198,341
Soda from its sulphate, making, F. Gutzkow 198,293
Spark arrester, H. S. Bryan 198,343
Speed recorder, reciprocating, W. W. Wythe 198,232
Station indicator, Kohler & Turk 198,395
Steam engine, rotary, W. R. Rightor 198,214
Steam generator, Renshaw & Tower 198,213
Stocking supporter, G. B. Bolton 198,183
Stopper fastener, F. J. Seybold 198,221
Stove, J. Jewett 198,243
Stove, cooking, D. Stuart 198,431
Stove, heating, J. A. Jones 198,394
Stove, parlor, F. H. Root 198,215
Tea pot, etc., N. Plympton 198,312
Telegraphs, receiver for harmonic, E. Gray 198,379
Telegraphy, Morse telephonic system of, E. Gray 198,373
Telephone or speaking telegraph, J. J. McTigue 198,406
Thill coupling, J. C. Gould 198,376
Thill coupling, J. E. Walton 198,257
Thrashing machine, J. Brown 198,187
Thrashing machine, W. Crozier 198,365
Thread, making waxed, D. U. Jennings 198,392
Tire adjuster, G. Tryon 198,258
Tobacco pail, A. Alford 198,178
Tobacco pipe, Fisher & Kistner 198,285
Trace holder, W. K. Hardenbrook 198,295
Turbine wheel, J. Stewart 198,429
Umbrella, A. Gilson 198,374
Vapor burner, J. Musgrave 198,411
Vehicle spring, wooden, Thompson & Muldoon 198,321
Vehicle wheel, C. W. Helden 198,384
Veneers, embossing mounted, C. H. Hagemann 198,381
Veneers, machine for cutting, J. D. McEachren 198,404
Ventilator, car, T. Frame 198,290
Ventilator, car, J. Williams 198,441
Wagon curtain fastener, Watters & Schuessler 198,252
Wagon rack, C. E. Adamson 198,285
Wagon spring, Haylock & Benedict 198,298
Washing machine, I. Hogeland 198,242
Washing machine, T. E. McDonald 198,205
Water closet, Sulzbacher & Yvelin 198,433
Weighing samples of grain, F. Fairbanks 198,364
Well, boring machine, J. Bennerseheidt 198,182
Windmill, J. J. Kimball 198,302
Wool, treating mineral, A. D. Elbers (r) 7,994
Wrench and vise, combined, H. T. Gates 198,291
Wrench, monkey, W. H. Glover 198,196
Wrench, monkey, Sanborn & Burroughs (r) 8,005
Wrench, screw, E. T. Barlow 198,264

DESIGNS PATENTED.

- 10,352.—FONT OF PRINTING TYPES.—Andrew Little, New York city.
10,353.—PARLOR OVEN STOVE.—J. A. Lawson, Troy, N. Y.
10,354.—JEWELRY.—J. W. Miller et al., Newark, N. J.
10,355.—CARPETS.—David McNair, Boston, Mass.
10,356.—CARPETS.—T. J. Stearns, Boston, Mass.
10,357.—BURIAL CASKET HANDLE.—W. M. Smith, Meriden, Conn.
10,358 to 10,360.—BASE BURNING STOVES.—N. S. Vedder et al., Troy, N. Y.
10,361.—WALL POCKETS.—M. G. Sesnon, Brooklyn, N. Y.
10,362.—BURIAL CASKETS.—W. M. Reid, Amsterdam, N. Y.

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