

(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 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° F. 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: 1. 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 1/4 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: 1. 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. 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 laquer.

(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 hornblende schist. No. 2 is a variety of bituminous coal. No. 3 is orthoclase. No. 4 is calc-spar.—S. B.—It is chlorite-hydroxyl 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 galena 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 & Whempley 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 198,368
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- 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.

[A copy of any of the above patents may be had by remitting one dollar to MUNN & Co., 37 Park Row, New York city.]