

class establishments) somewhat above concert pitch, and are kept there by repeated tunings, until the piano-forte has settled and the strings have fully stretched, which is known by the instrument remaining at precisely the same pitch for some time. After this the strings will not stretch except by an increase of the temperature, which will lengthen the iron frame on which the strings are stretched, or by hard use, when, under the constant concussion of the hammers upon the strings, the latter will stretch more or less and get out of tune.

(13) G. R. B. asks: 1. Can you inform me if an induction coil is required with the pan telephone described on page 162, No. 11, current series of the SCIENTIFIC AMERICAN? A. Yes. 2. Should the induction coil used in Blake transmitter be the same resistance as coils in each telephone? A. It should have two or three times the resistance of the telephone coil.

(14) R. R. R. writes: In the Faradic battery operated by an open Smee's cell, I believe the primary wire of the induction coil is composed of two layers of No. 16 or No. 14 cotton covered copper wire. I wish to make an induction coil with the core of the same length and same diameter to be operated with a small Grenet cell. 1. Should the primary wire be constructed as in the former case? Or if modified, in what respect? A. Use three layers of No. 18 wire for the primary. 2. With the same sized core how should the primary be constructed to give the best result with a Bunsen and with a large Leclanche respectively? A. The same construction will answer. 3. With core same size as above, and with secondary coil composed of, say, 10 layers of No. 40 telephone wire, what cell should be used, and how should the primary coil be constructed to get the best results? A. Make the primary as above described, and use a single cell of Grenet.

(15) "Honolulu" writes: I saw a notice in SCIENTIFIC AMERICAN some time ago of the application of electricity to growing crops. Will you let me know the best method of applying it? A. It could not be profitably applied. It is an interesting experiment, and that is all. 2. We are very much troubled with droughts here, and would feel obliged to you if you could give me some idea how to overcome them. A. Your only remedy is artificial irrigation. We know of no way of inducing rain.

(16) A. G. N. asks: What style and size battery would be the most economical to run one electric light on the incandescent principle? A. It depends upon the kind of incandescent lamp and on the time you wish to run it. To run a Werdemann or Regnier lamp for a few hours, probably 20 to 25 one quart cells of Bunsen battery, or one of its modifications, would be the best. To run a single Edison lamp would require more battery elements.

(17) W. A. McA. writes: I have a specimen which I think contains lead and silver. Will you give in the Notes and Queries of the SCIENTIFIC AMERICAN the most simple tests by which these two metals may be made to tell their presence? A. Powder the ore and boil in pure nitric acid mixed with half its weight of water for some time; dilute somewhat with water, and filter. Add to the filtrate a small quantity of sulphuric acid. A precipitate indicates lead. Filter this solution and add to the concentrated filtrate a few drops of pure hydrochloric acid. A white precipitate, insoluble in boiling water, and which changes in color by the action of sunlight, indicates silver. When only very small quantities of the metals are present, unless these tests are performed with great care, the reactions are apt to escape notice altogether. In ores where the silver is in the state of chloride, bromide, etc., this test does not give indications, especially if the silver is present as chloride. The best test for silver in an ore is the fire assay (sacrificion assay).

(18) F. D. C. asks (1) how to saw petrified wood or other flinty material for sleeve buttons. A. Apply diamond dust moistened with brick oil to the edge of a thin iron disk revolved in the lathe. For full particulars as to stone cutting consult Byrne's "Handbook for the Artisan." 2. How can I make an acid ink to write on oil paper for a stencil to print from? A. Try nitric acid alone.

(19) "Subscriber" asks how to make a black ink suitable for staining leather. A. Use a moderately strong aqueous solution of coppers. The tannin in the leather will develop with it the black color.

(20) V. B. H. asks for a good black paint or something else that will answer to black small castings by dipping them in something that will varnish. A. Dissolve asphaltum in oil of turpentine and add a little lampblack or fine bone black.

(21) L. C. C. asks: 1. Can you inform me where to purchase the ammonia used by the ice machines (not the common aqua-ammonia), think it is called gaseous ammonia, which is liquefied by pressure? A. Liquefied ammonia is not an article of commerce. It is only prepared as required for use. 2. What is known as a 20 ton ice machine? A. One that produces 20 tons of ice a day.

(22) G. W. L. asks what the difference is between tin crystals and tin salts, as used in dyeing. A. Both refer to stannous chloride or protochloride of tin.

(23) E. A. J. asks how to remove the scale from brass castings, to give a surface on which solder may be flowed with a hot copper. A. Dissolve 6 oz. bichromate of potash in three pints of warm water, when cool, add 6 fluid oz. of sulphuric acid. Rinse the castings well after pickling in this solution.

(24) F. R. G. asks how to paint a smoke stack on a small portable engine. It requires something that will resist the action of heat. I have been advised to use asphaltum dissolved in turpentine. A. Good asphaltum dissolved in oil of turpentine is one of the best varnishes for this purpose.

(25) H. M. A. asks: What is the best "stickum" for labels on boxes, also labels on casks: something to make them stick and not cackle or wash off easily? A. Soften glue in cold water and dissolve it in strong vinegar. Mix with it a quantity of dry

starch about equal to the glue taken, first having boiled it with water sufficient to form a paste. It works better when warm.

(26) W. J. H. asks if there is any preparation for polishing or staining India-rubber. A. We know of no satisfactory way of staining rubber. Hard rubber may be polished with a little pumice stone and oil.

(27) H. F. P. asks how to make gold ink for writing and printing. A. Triturate gold leaf with a little honey in a mortar until the metal is reduced to a fine state of subdivision; dissolve out the honey with warm water, and mix the gold with a little gum water, used for writing and illuminating. In printing the gold is usually applied subsequent to the printing.

(28) H. L. S. asks: 1. Is there any known substance that if a thin piece of it, say like a piece of paper, window glass, or tin, were placed between a permanent magnet and piece of soft iron would prevent the magnet from attracting the iron? A. No. 2. I would like you to give me a simple illustrative explanation of the theory of how electricity is generated by a dynamo-electric machine. A. You will find this information in an article on dynamo electric machines, in SUPPLEMENT No. 161.

(29) W. E. M. asks: Can you inform me of any metal or alloy that will dissolve by the application of some of the acids (such as sulphuric, hydrochloric, or nitric), and at the same time the acid used to be incapable of any action on fatty substances (such as oils)? A. Metallic zinc is attacked and dissolved by dilute sulphuric acid. The dilute acid has little effect on most oils when used cold.

(30) J. E. S. writes: I wish to make a hollow prism to hold carbon bisulphide, but have not found a cement that will resist it. Can you tell me what to cement the glass with? A. The composition of glue and glycerine used in printing ink rollers answers very well. It melts by aid of heat.

(31) J. E. S. asks: Is there any rapid and practical purpose by which bright copper can be made to acquire the dark rich color that is seen on copper coins unused for many years? The oxide formed by heating scales off easily. A. Clean and dip them in a strong aqueous solution of cupric chloride.

(32) T. R. W. asks: What will take aniline violet and aniline black ink stains out of linen and bleached cotton fabrics? The salts of lemon and oxalic acid seem to have but little influence on it. A. Try solution of bleaching powder or javelle water.

(33) A. L. H. asks: What effect does galvanized iron pipes have on drinking water—good or bad? A. Bad, with certain kinds of water, and especially if allowed to stand in the pipes for any length of time, very bad.

(34) J. C. asks: 1. How can I harden plaster of Paris after making a mortar out of it with water? A. After the plaster becomes thoroughly dry you may soak it in glue size. When this becomes dry the plaster will be quite hard. 2. What chemical or acid is used in taking a transfer from a printed cut and transferring on a plain block of boxwood? A. Caustic potash dissolved in alcohol. 3. Can I make a mould out of plaster of Paris? A. Oil the pattern, mix the plaster quickly into a thick smooth cream with cold water, and pour into the mould at once. When hardened set aside in a warm place to dry. Is there a book in the market that gives instruction in sculpture: if so, where can it be obtained? A. Address the booksellers who advertise in this paper.

(35) M. C. S. asks: What substances are best to absorb the moisture in a refrigerator? Is crude chloride of calcium (bittern) good? Is lime good? A. Fine unslaked lime will answer about as well as anything. Chloride of calcium is an excellent absorbent of moisture.

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

C. S. C.—It consists principally of sulphides of copper, and possibly carries a trace of gold.—J. W. M.—A silicious kaolin.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

November 30, 1880.

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, 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. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications not being printed, must be copied by hand.

Accountant instrument, mechanical, H. Johnson 234,875
Aerial apparatus, F. W. Brearey 234,947
Aeriform fluids, apparatus for mixing, J. F. Barker 234,904
Album, etc., clasp, C. Posen 235,016
Annunciator, electrical, T. W. Lane 234,993
Axle box, car, W. P. Wylly 234,901
Bale tie, J. G. Battelle 234,943
Barrel heater, Cook, Chase & Beard 234,908
Band cutter, Blehn & Weldauer 234,944
Bath box for chemical and photographic purposes, ventilated, J. C. Macurdy 234,879
Bells with brass, coating stock, O. B. Wilson 234,900

Table listing various inventions and their patent numbers, including items like Belt, driving, E. & C. Poullain, Binder for papers, etc., M. King, Biotting pad, C. M. Lothrop, Boiler and other furnaces, W. Ennis, etc.

DESIGNS.

Table listing designs and their numbers, including items like Bell, box, H. Thau, Carpet, H. Horan, Carpet, H. Hunt, etc.

TRADE MARKS.

Table listing trade marks and their numbers, including items like Crackers, E. W. A. Ibee, Medical compound for dysmenorrhoea, M. J. Fuzard, etc.

English Patents Issued to Americans.

From November 23 to November 30, 1880, inclusive.

Table listing English patents issued to Americans, including items like Beverage, A. W. Armstrong New York city, Celluloid, decorating, A. Hart et al., New York city, etc.